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CONTENTS AND SUBJECT INDEX

Diagnosis of Early Poliomyelitis. J. E. Gordon, M.D., Detroit..1043

Immunity to Poliomyelitis in the General Population. S. D. Kramer, M.D., Boston.....1048

Therapeutic Use of Antipoliomyelitis Serum in Preparalytic Cases of Poliomyelitis. William H. Park, M.D., New York.....1050

Poliomyelitis in the State of New York in 1931. Frank W. Laidlaw, M.D., Middletown, N. Y.....1053

Papers of Drs. Gordon, Kramer, Park and Laidlaw discussed by Drs. Aycock, Shaw, Pollock, Leake, Silverman, Kramer, Amoss, Gordon, Park and Laidlaw.

Acute Anterior Poliomyelitis in the Chicago Area in 1931. S. O. Levinson, M.D.; Clarice McDougall, B.S., and William Thalhimer, M.D., Chicago.....1058

Intestinal Stasis in Infants and Children. Charles G. Kerley, M.D., New York.....1062

Discussed by Drs. Loeber, Wall, Moore and Kerley.

Lymphogranuloma Inguinale. H. F. DeWolf, M.D., and J. V. Van Cleve, M.D., Cleveland.....1065

Discussed by Drs. Weidman, French, Hollander, Cole, Fox and Van Cleve.

Xanthoma Multiplex. William P. Finney, M.D.; Hamilton Montgomery, M.D., and Gordon B. New, M.D., Rochester, Minn.....1071

The Value of Salmon Oil in the Treatment of Infantile Rickets. Martha M. Eliot, M.D.; E. M. Nelson, Ph.D.; Susan P. Souther, M.D., and M. Katharine Cary, A.B., New Haven, Conn.....1075

The Antitoxin Treatment of Erysipelas. Douglas Symmers, M.D., and Kenneth M. Lewis, M.D., New York 1082

CLINICAL NOTES, SUGGESTIONS AND NEW INSTRUMENTS

Shade-View for X-Ray Films. Edgar G. Ballenger, M.D.; Omar F. Elder, M.D., and Harold P. McDonald, M.D., Atlanta, Ga.....1084

Guide for Passage of Esophageal Dilators. Percy B. Davidson, M.D., Boston, and Fernando Biguria, M.D., Guatemala.....1084

COUNCIL ON PHARMACY AND CHEMISTRY 1085

COMMITTEE ON FOODS 1085

EDITORIALS

The Cholesterol Function of the Gallbladder 1086

Gastric Acidity.....1087

Changes in Nasal Epithelium...1087

Synthetic Bacteria.....1088

CURRENT COMMENT

The Death of Ronald Ross.....1088

Hypervitaminosis 1088

Skeletons of Malignant Cells....1089

(Subject Index on next page)

ASSOCIATION NEWS 1089

Entered as Second-Class Matter, June 25, 1885, at the Postoffice at Chicago, Ill., under Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Sec. 1103, Act of Oct. 3, 1917, authorized on June 14, 1918. If undeliverable, forwarding and return postage is guaranteed.
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Other SAUNDERS' NEW BOOKS on Page 3

SUBJECT INDEX TO THIS ISSUE

The letters used to explain in which department the matter indexed appears are as follows: The Star (*) indicates an Original Article; "ab," abstract; "E," Editorial; "C," Correspondence; "Ml," Medicolegal; "ME," Medical Economics.

Abdomen, laparoscopy 1096
Acetylcholine, effect on blood pressure..ab-1124
Alcohol in middle ear....1105
Alcoholism, instruction about....1098
tactual perception in....ab-1112
Anemia, agastric, so-called....ab-1120
primary, neurologic aspects....ab-1113
Anemia, Pernicious, liver therapy effect on neurologic signs ab-1112
somatic and psychotic disorders in...ab-1115
splenomegalic, of Pende type....ab-1120
value of vitamin B....ab-1116
Angina, Vincent's, tonsillectomy for...ab-1117
Arteriosclerosis, cerebral, biochemical changes ab-1124
Arthritis, monarticular, simulating tuberculosis ab-1113
Association News 1089
Auricular Fibrillation, quinidine in....ab-1114

Bacteria, synthetic E-1088
Bassler Belt for intestinal stasis....*1062
Bauer, Julius, to give lectures....1092
Blood pressure, hypertensive disease....1102
pressure, effect of acetylcholine on..ab-1124
sedimentation speed, determining....ab-1124
sugar tests in 3 constitutional types..ab-1123
Book Notices 1107
Books Received ....Adv. page 34
Brain, changes in cardiac disorders....ab-1123
hemorrhage, hemihypertonia postapoplectica ab-1115
hemorrhage (possible) in diplopia....1103
injuries, atlanto-occipital evacuative trepanation in ab-1113
surgery, recent advances in....ab-1124
British Association for the Advancement of Science 1094
Bureau of Investigation....1100
Butler University, health department at...1090

Calcium, effects in diet....1105
conservation and vitamin D in adult..ab-1115
Calculi and vitamin A....1103
Cancer cells, mineral skeleton of....E-1089
facilities for treating, Wisconsin....1093
Castle, Jerry, victimizes Duluthians....1091
Cells, living, adhesiveness of leukocytes as functional test ab-1121
Chiggers, prevention 1106
Children, abnormal 1098
child health conference, Thomaston, Conn. 1089
Chiropractic: practitioner as a physician Ml-1110
Cholesterol function of gallbladder....E-1086
Christian, E. A., honored....1091
Colitis, ulcerative, of psychogenic origin..ab-1117
Colon, spastic, in infants and children...*1062
Committee on Foods....1085
Consultations over the telephone....1097
Correspondence 1102
Council on Medical Education....1106
Council on Pharmacy and Chemistry....1085
Curtis, G. M., wins golf trophy....1090
Cyanides, hazards from, in electroplating..1104

Deaths 1099
Decidua cast or "placental tissue,"....1106
cells, chondriosomes in....ab-1124
Dental Medicine, lectures on....1092
Diabetes Insipidus, xanthoma multiplex in *1071
Diplopia, possible cerebral hemorrhage with.1103
Diseases, reportable, New Mexico....1092
Dura Mater, endothelioma of....ab-1114

Ear, middle, alcohol in....1105
East Mississippi Post-Graduate Institute...1091
Eczema or ringworm....1106
alimentary allergy of children with...ab-1123
treatment 1103
Electrophone C-1102
Electroplating, hazards from cyanides in..1104
Endometriosis, genesis and therapy....ab-1121
Epidemic diseases, Illinois....1090
Epithelium, nasal, changes in....E-1087
Erysipelas, antitoxin treatment....*1082
recurrent 1105
Erythrocytes, elliptic human....ab-1116
Esophagus dilators, simplified guide for passage of *1084
Evidence: hospital records, when public records Ml-1110

Farwell, F. M., spurious magazine agent..1093
Fees for telephone consultations....1097
Femur fracture, bone-graft peg for....ab-1114
Fistula, gastrocolic, postoperative....ab-1122
Food allergy, note on....ab-1118
allergy of children with eczema....ab-1123
Fordyce Disease on lip....1104
Foreign Letters 1094
Fracture, healing, on normal diet....ab-1114
ununited and delayed union....ab-1115

Gallbladder calculi, pancreatic hypofunction in ab-1120
cholesterol function of....E-1086
Gastro-Enteritis, outbreak, Baltimore....1091
Goiter, sporadic, on genotypical basis..ab-1124
Gonorrhea salpingitis, electrolyte threshold of serum in....ab-1123

Hair, fragilitas crinium and trichorrhexis nodosa 1104
Hand, Edward, memorial to, dedicated....1093
Health in the Congo....1098
unit, full time county, Maryland....1091
Hearing, Oratone C-1102
Heart, cor pendulum: gastroptosis: bathygastri ab-1124
disease, cerebral changes in....ab-1123
disease, lectures on....1089
Hemihypertonia postapoplectica ab-1115
Hemophilia 1104
in infancy and in childhood....ab-1111
Herpes of lip....1104
Hospital, new, Springfield, Mass....1091
Housing, better, and mortality statistics, France 1095
Hygiene in teacher training curriculum....1097

Immunization against infections due to filtrable virus 1095
Infant foods, organisms in....ab-1111
premature, feeding technic for....ab-1111
Infection, focal, theory of abused....ab-1113
Insurance, life, for physicians....1098
Intestines stasis, in infants and children..*1062
Iodine, effect of administration....ab-1115
Iron retention by pregnant women....ab-1115

JOURNAL, spurious agent....1093

Kidney disease, produced by roentgen rays ab-1119

Larynx, xanthoma multiplex involving...*1071
Lead poisoning due to snuff....1098
Learmonth, James R., returns to Scotland.1091
Leprosy scare in Berlin....1097
Leukocytes, adhesiveness, functional test of living cells ab-1121
Licensure, annual registration due Oct. 1, Nebraska 1092
Lip, vesicles on....1104
Liver cancer, primary....ab-1119
Louisiana State University, changes....1091
Lungs, cancer, primary, diagnostic mistakes ab-1121
collapse, massive ab-1117
Lymphogranuloma inguinale....*1065; ab-1119
Hodgkin's disease....ab-1117

McCormick, Louis P., honored....1093
Magnesium, effects in diet....1105
Marriage and syphilis....1103
of mental defectives....1094
Marriages 1099
Maternal mortality and antenatal care..ab-1119
mortality, study of, New York....1092
Medicolegal 1110
Meetings, Coming Meetings....1110
Meninges hemorrhage, alternating oculomotor paralysis in....ab-1112
Meningioma of dura....ab-1114
Mental Defectives, marriage of....1094
Metabolism, basal, lower rates of vegetarians, ...ab-1114
Miller, W. H. H., denied release....1090
Myoma, uterine, abdominal hysterectomy for ab-1118

National Safety Congress....1093
Nervous System, central infections, reaction of microglia in....ab-1124
Neurosyphilis, pathologic aspects....ab-1118
New and Nonofficial Remedies....1085
News 1089
Noise, protection against....1094
Northwestern Ohio Medical Association....1092
Nose, changes in epithelium....E-1087

O'Connell, C. Leonard, honored....1093
Oleothorax ab-1120
Oratone C-1102

Pancreas, hypofunction in cholelithiasis.ab-1120
Paralysis, alternating oculomotor....ab-1112
Peptic Ulcer, gastric nerve changes in..ab-1122
Personality, inconstancy of formal structure ab-1112
Physician, life insurance for....1098
Placenta tissue 1106
Pneumococci, composite E-1088
Poliomyelitis, acute anterior, in Chicago..*1058
antiserum in preparalytic cases....*1050
chronic syphilitic ab-1113
early, diagnosis *1043
immunity to *1048
in New York state in 1931....*1053
retards opening of schools, Philadelphia..1093
Pregnancy hygiene and mental mortality.ab-1119
iron retention during....ab-1115
Pseudosclerosis, spastic ab-1118
Psittacosis made reportable, New Mexico..1092

Queries and Minor Notes....1102

Radio Program 1089
Radon, new apparatus for producing....1095
Relapsing Fever made reportable, N. Mex..1092
Research, misdirected....1094
Retina, grouped pigmentation of....ab-1113
Rickets, salmon oil in....*1075
Ringworm, eczema or....1106
Rockefeller Institute, changes at....1092
Roentgen Ray films, shade-view for....*1084
Ross, Ronald, death....E-1088; 1093

Salmon oil, value in infantile rickets....*1075
Serum, normal, bactericidal power of..ab-1119
therapeutic, intralumbar application..ab-1123
Shade-view for x-ray films....*1084
Skin temperature studies....ab-1117
Snuff, lead poisoning due to....1098
Society Proceedings 1110
Sodium chloride, effects in diet....1105
Speaker's Bureau course on fundamentals.1090
Spinal Cord, aspects of primary anemia.ab-1113
Spinal Puncture in poliomyelitis diagnosis.*1043
Splanchnoptosis, treatment ab-1118
Splenomegaly, pernicious anemia of Pende type ab-1120
Springs, contaminated, Cleveland....1092
State Board Examinations....1106
Stomach mucus, protective action....ab-1122
acidity, normal range....E-1087
ptosis, cor pendulum: bathygastri....ab-1124
Syphilis in children, acetarsone in....ab-1111
marriage and 1103

Tissue, irradiated, causes of cell death in ab-1119
Tonics and Sedatives....Adv. page 28
Tonsillectomy as curative for Vincent's angina ab-1117
Trachea, xanthoma multiplex involving..*1071
Trephining, atlanto-occipital evacuative, in contusion ab-1113
Trombidiosis, prevention of....1106
Tuberculosis, instruction in....1092
Missouri Tuberculosis Association, jubilee 1091
Tuberculosis, Pulmonary, hemoptysis arrested by transfusion....ab-1120
Tumors, malignant cells, mineral skeleton E-1089
Typhoid in Illinois....1090

Ultraviolet Rays and atmosphere of large cities 1097
Uterus, myoma, abdominal hysterectomy.ab-1118

Varicose Veins, "resting infection" in..ab-1112
Vegetarians, lower basal metabolic rate.ab-1114
Vitamin A and calculi....1103
B in pernicious anemia....ab-1116
D and calcium conservation....ab-1115
hypervitaminosis E-1088
Vocation, choice of, and heredity....1096

Whooping Cough, epidemic in Illinois....1090

Xanthoma multiplex *1071

Yale University, new experimental laboratory 1089

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DIAGNOSIS OF EARLY POLIOMYELITIS

J. E. GORDON, M.D.
DETROIT

Stated simply and in a homely way, the diagnosis of preparalytic poliomyelitis consists of a healthy clinical suspicion and a lumbar puncture. Three kinds of evidence contribute to the soundness of the clinical suspicion.

Epidemiologic factors offer aid in that the disease is primarily one of early childhood, most cases occurring before the sixth or seventh year of life. The seasonal distribution is largely limited to late summer and early autumn, to such an extent that poliomyelitis at other times of the year, winter and spring, is most uncommon. The geographic distribution directs major attention to the disease in north temperate climates. The symptoms are those of many general infections, including typically a low grade fever, headache and vomiting. Stiffness of the neck, rigidity of the spine and ataxic tremor are three physical signs of outstanding clinical consideration.

Too often the well appreciated advantages of early diagnosis tend toward overemphasis of poliomyelitis, particularly during the period of seasonal prevalence and if the disease is epidemic, with the result that other conditions, of themselves as urgent as poliomyelitis, suffer delay in management because of confusion with that disease. No less stress must be placed on determining poliomyelitis before paralysis, but need does exist for more critical judgment in eliminating allied conditions. The general opinion among physicians that clinical diagnosis of poliomyelitis has not reached the exactness of other communicable diseases finds ready substantiation (table 1). The clinical diagnosis of scarlet fever, whooping cough and erysipelas has been substantiated in most instances (95.6 per cent). Other common infectious diseases occupy an intermediate position, but poliomyelitis ranks last, with only 50.4 per cent of reported cases confirmed by clinical study and laboratory investigation.

Despite more general appreciation of the existence of preparalytic poliomyelitis and the excellent descriptions [1] of its clinical nature, uncertainty in decision still attends consideration of many illnesses suggestive of early poliomyelitis. Some of the practical problems in diagnosis will be discussed and illustrated by case reports, with a review of the clinical and laboratory methods of detecting the disease, in the hope that more widespread case finding of poliomyelitis may be accomplished with less confusion of other acute medical conditions.

From the Herman Kiefer Hospital and the Division of Epidemiology, Department of Health.

Read before the Section on Pathology and Physiology at the Eighty-Third Annual Session of the American Medical Association, New Orleans, May 12, 1932.

1. Aycock, W. Lloyd, and Luther, Eliot H.: Preparalytic Poliomyelitis, J. A. M. A. **91**: 387 (Aug. 11) 1928. Aycock, W. Lloyd; Luther, E. H.; McKhann, C. F.; Smith, E. C., and Kramer, S. D.: Preparalytic Poliomyelitis, J. Infect. Dis. **45**: 175 (Sept.) 1929. Draper, George: Acute Poliomyelitis, Philadelphia, P. Blakiston's Son & Co., 1917. Kramer, S. D.: The Diagnosis of Poliomyelitis in the Preparalytic Stage, Rhode Island M. J. **14**: 69 (May) 1931.

CLINICAL COURSE

The clinical course of poliomyelitis is divided into three periods. Figure 1 is a graphic presentation of its progressive development. The incubation period is not well defined, but epidemiologic evidence indicates ordinarily a period of from seven to fourteen days between exposure and the first clinical symptoms, the seventh to the tenth day being most common.

The initial stage represents a general systemic reaction. The important symptoms include fever, which usually is from 101 to 102 F., headache and some disturbance of the gastro-intestinal tract commonly causing nausea and vomiting. Diarrhea may be a symptom, but the more common complaint is constipation. The duration is from twenty-four to forty-eight hours. Many times the condition is clinically definite and recognizable as a disease process, but more frequently the symptoms are so indefinite as to escape attention, or indeed the process may be of subclinical nature, not recognizable by ordinary diagnostic criteria. Granted that the morbid changes are sufficiently distinct to constitute actual disease, nevertheless, the identity of the infection remains indeterminate. The systemic phase presents no known characteristics definitely qualifying it as poliomyelitis.

The infection may or may not progress beyond the initial phase. Commonly it does not. In the event that it does, a latent period usually intervenes before symptoms of clinical progression become manifest. This interval is from one to four days, averages perhaps two days and occasionally is as long as a week or even more. By contrast with this anticipated behavior, the latent period may not be a feature at all, the clinical course being rapidly progressive and comparable to fulminating infections in epidemic meningitis and other acute communicable diseases. Involvement of the central nervous system is the outstanding feature of poliomyelitis in this second clinical phase. Fever recurs, and the headache returns with increased intensity. Drowsiness is a prominent feature, but the patient is readily roused, and then irritability and restlessness are evident. Definite indications of meningeal irritation are present; stiffness of the neck and tenderness or rigidity of the spine. Ataxic tremors or twitchings of the muscles of the extremities are of later development,[2] and if exaggerated in a particular muscle group may indicate the site of future paralyses. A

2. Draper, George: Significant Problems in Acute Anterior Poliomyelitis, J. A. M. A. **97**: 1139 (Oct. 17) 1931.

general hyperesthesia is to be expected at this time, but actual pain is more likely to be limited to the spine or to some particular group of muscles. Vasomotor disturbances are common. The tache cérébrale is prominent; sweating is pronounced, particularly about the head, and the face is flushed, often with circumoral pallor, while the general skin surfaces are many times mottled. Paralysis or even weakness is by no means an invariable feature of invasion of the central nervous system, but if paralysis does develop it is usually present by the third day of this second period. One instance has been observed in which paralysis was delayed until the twelfth day, on several occasions for as long as eight days. The disease at this time can be determined clinically as poliomyelitis.

TABLE 1.—*Clinical Diagnosis of Acute Communicable Diseases (Herman Kiefer Hospital 1928-1931)*

Disease	Number of Referred Cases	Diagnosis Confirmed	
		Number	Percentage
Scarlet fever	9,605	9,204	95.8
Whooping cough	400	379	94.8
Erysipelas	972	910	93.6
Chickenpox	346	316	91.3
Measles	900	816	90.7
Mumps	160	135	84.4
Diphtheria	4,980	3,850	77.3
Cerebrospinal meningitis	1,591	1,227	77.1
Smallpox	264	197	74.6
Encephalitis	52	35	67.3
Typhoid fever	53	34	64.2
Poliomyelitis	446	225	50.4

Identification of poliomyelitis of the third stage, that of paralysis, is more readily accomplished and does not present the confusing problems of the preparalytic period.

SYSTEMIC PERIOD IN POLIOMYELITIS

When signs and symptoms are limited to those of a purely systemic invasion, complete inability exactly to designate an infection as poliomyelitis must be admitted. Observation of many such patients permits the opinion that they present a rather uniform clinical appearance. The following instance illustrates this kind of infection and suggests abortive poliomyelitis:

CASE 1.—Richard C., a boy, aged 4 years, became ill on Sept. 23, 1931, with a fever of undetermined degree and a complaint of headache. He vomited that day and also the next day. Two loose stools were noted on the day of onset, and he complained of abdominal pain. Subsequently constipation was well marked. He was referred to the hospital with the diagnosis of poliomyelitis on the third day of illness. His physician had the impression of some limitation of movement of the neck, and the fever had increased to 101 F.

Physical examination revealed a vague blotchiness of the skin, apparently of vasomotor origin. The mucous membranes of the pharynx were moderately injected. The tongue was coated. Examination of the heart and lungs revealed no significant information. Stiffness of the neck or of the spine could not be demonstrated. Examination of the skeletal muscles revealed no weakness, tenderness or tremor. The superficial abdominal reflexes could not be elicited. Deep tendon reflexes were without change. Examination of the blood revealed 4,130,000 erythrocytes, 70 per cent hemoglobin and 6,100 total leukocytes, of which 34 per cent were neutrophils and 66 per cent lymphocytes. In the absence of more significant clinical evidence, lumbar puncture was deferred. Next day the fever was no more than 99.2 F. and later was within normal limits. By the sixth day the child had completely recovered.

No progression was noted beyond an indefinite systemic infection, and yet the clinical nature of the illness corresponded precisely with that many times observed with patients who ultimately developed paralysis. The case was not reported as poliomyelitis.

Lumbar puncture has been performed with sufficient frequency to assure its lack of diagnostic value at this stage of poliomyelitis. The cerebrospinal fluid is unchanged from the normal, because increase in the number of cells and the presence of globulin are the result of meningeal irritation, the symptoms of which are not present. The next case report illustrates this, and also the need of continuous careful observation for evidence of progression.

CASE 2.—Allen A., a girl, aged 7 years, became ill on Aug. 17, 1931, with evidences of a general systemic infection. She complained of some tenderness of the muscles of the right leg and of the neck. Neurologic examination revealed no abnormal findings. On the following day the fever was slightly elevated to 99.4 F. The tenderness of the leg continued, and the left lower abdominal reflex could not be elicited. On August 19, lumbar puncture was performed because of continued pain in the leg, the lost abdominal reflex and the complaint of tenderness of the muscles of the neck, although stiffness of the neck or spine could not be demonstrated. The cerebrospinal fluid was not under increased pressure. The number of cells per cubic millimeter was 5. No globulin was demonstrated, and quantitative examination of the spinal fluid gave 62 mg. of sugar per hundred cubic centimeters of fluid. She was essentially well until August 21, when she complained of nausea, vomited and had a definitely stiff neck. The clinical observations at this time corresponded precisely to those of preparalytic poliomyelitis. A second lumbar puncture gave cerebrospinal fluid containing 450 cells, principally lymphocytes, and globulin in evident proportion. The fluid was under increased pressure. The patient recovered without paralysis. The official report to the health department was poliomyelitis.

The cerebrospinal fluid during the systemic phase was normal. Later, when the neck became stiff and the spine was rigid, a second lumbar puncture yielded a fluid readily confirming the clinical diagnosis.

INVOLVEMENT OF THE CENTRAL NERVOUS SYSTEM IN EARLY POLIOMYELITIS

With advance of the infectious process to produce meningeal irritation, the most difficult time in clinical interpretation of poliomyelitis is at hand. The problem demands exact niceties in judgment and above all a consideration of the illness from the standpoint of general medicine without undue bias in favor of poliomyelitis because it happens to be currently prevalent or is a common communicable disease of the summer months. Other conditions are to be carefully eliminated before recourse to lumbar puncture. Lumbar puncture at this time may be of distinct value in permitting a diagnosis not otherwise definite, but if an exacting clinical analysis has preceded this measure there will be relatively few surprises when the spinal fluid is examined. Danger exists of being too con-

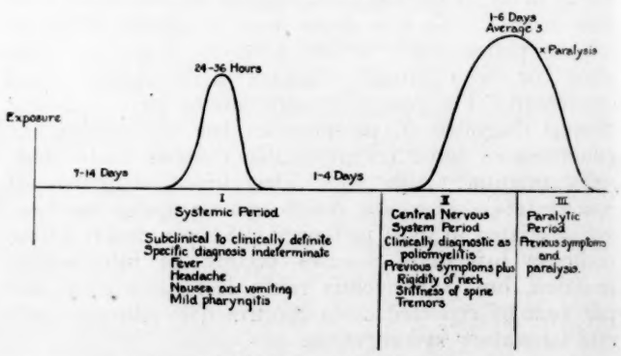

Fig. 1.—Clinical course of poliomyelitis.

servative and delaying lumbar puncture and a confirmed diagnosis until the benefits from modern management are less satisfactory. There is perhaps equal likelihood of performing lumbar puncture prematurely or unnecessarily. The possibility always exists that a sanguineous fluid may be obtained, particularly if the patient is young and not readily restrained. Examination of a fluid containing blood is valueless, and unfortunately

Fig. 2.—*A*, spine sign, showing rigidity of the spine. There is pain with attempted flexion. *B*, normal child, showing well rounded curve of the back.

the fluid obtained by subsequent lumbar punctures may not be free from blood for several days. Lacking either precise clinical or laboratory evidence, the problem is difficult. Another consideration involves the possibility of initiating involvement of the central nervous system by drainage of spinal fluid, through permitting readier penetration of the virus through the choroid plexus. The available experimental evidence is contradictory, but the possibility warrants consideration. Since paralysis most commonly develops on the third day, it would appear that patients seen early with indefinite clinical symptoms present no great urgency for lumbar puncture. On the other hand, if the patient is seen late in the preparalytic period the necessity for lumbar puncture is usually apparent.

The guiding signs are resistance of the neck to anterior flexion and stiffness of the spine, when they follow or are associated with headache, fever and vomiting (fig. 2). Ataxic tremor and tenderness of an extremity are later developments and probably indicate actual involvement of the anterior horn cells. The superficial abdominal and cremasteric reflexes are among the earliest altered. Their absence is significant. The deep tendon reflexes usually give little information from a single examination, but tend to be hyperactive early in the disease and later depressed or absent. Inequality of the reflexes on the two sides is important, and variation at successive examinations still more so. The Kernig, Babinski and Brudzinski signs are usually not demonstrated. The neck is regularly stiff, and yet when the patient is raised by the shoulders the head drops backward and cannot readily be raised, a feature not characteristic of such other infections of the central nervous system as meningitis and tetanus (fig. 3).

If there is merely an unconfirmed history of back pain or a questionable resistance of the neck, clinical observation may well be continued and examination of the spinal fluid deferred. If one or more of the three important physical signs—stiff neck, rigid spine or ataxic tremor—can be demonstrated, lumbar puncture should be done immediately.

DIFFERENTIAL DIAGNOSIS

Unnecessary alarm about poliomyelitis may be avoided by attention to certain outstanding clinical features which discount the diagnosis of poliomyelitis and suggest some other condition. They are: swelling of the affected extremity, well marked cervical adenitis, a critically ill, comatose patient, high fever, particularly of the septic type, localized abdominal tenderness, prolonged illness with subsequent paralysis, regional sensory disturbance with paralysis and convulsions.

The impression is not to be gained that these clinical observations are incompatible with poliomyelitis. The disease uncommonly may be initiated with convulsions, and the fever at times exceeds 104 F. Because of their rarity, they are of sufficient importance to demand careful review of all the clinical evidence before entertaining the diagnosis of poliomyelitis and the indication for lumbar puncture.

The possibility of poliomyelitis is commonly suggested by inability of the patient to use one of the extremities properly. This may actually be due to weakness or to some other cause. Swelling of the affected part is generally sufficient to eliminate poliomyelitis. The more probable cause is osteomyelitis, epiphysitis, suppurative arthritis or acute rheumatic fever, all of which have been encountered in practical consideration of poliomyelitis.

Patients with infantile paralysis are many times first seen by a physician when weakness of some muscle group is already present. The paralysis of poliomyelitis develops within a relatively few days. If paralysis occurs at a time far removed from the original illness, a matter of many days or even weeks, the condition is probably not poliomyelitis, but more likely a similar paralysis such as that after a severe infection with diphtheria, or with scurvy.

At times the fever may be well elevated, but in general an infection with a fever of 104 F. or more is probably not due to the virus of poliomyelitis. If the fever is of an irregular or septic type, the suspicion is more definite that some other infectious agent is responsible. This one factor alone often permits differentiation from pyelitis, suppurative otitis media and typhoid fever. With these conditions and particularly

Fig. 3.—*A*, stiffness of the neck, showing the limited forward movement of the head. There is associated pain. *B*, head drop. The head drops backward as the child is lifted by the shoulders.

with pneumonia, young children not infrequently have meningismus. This state, with the high fever, usually suggests the proper interpretation.

A mild nasopharyngitis is not uncommon in early poliomyelitis. At times the infection may be more severe and resembles closely an ordinary tonsillitis. The reaction of the regional lymph nodes is an important consideration. Some enlargement of these structures can regularly be demonstrated in poliomyelitis, but a marked lymphadenitis is suggestive of some other condition, particularly tonsillitis and sometimes scarlet fever.

Emphasis has been placed on the general systemic nature of poliomyelitis, and evidence exists that the lymphatic structures are largely affected. At necropsy the mesenteric lymph nodes are prominently involved. Hyperplasia of Peyer's patches may be so marked as to suggest typhoid fever. Moderate hyperplasia of the spleen is a feature. These changes suggest the underlying cause of the abdominal tenderness and the nausea and vomiting that initiate the disease. Abdominal tenderness in poliomyelitis is usually indefinite and generalized. Distinct local tenderness, particularly in the right lower abdominal quadrant, should indicate the possibility of acute appendicitis. I have twice had perforated appendical ulcer referred as poliomyelitis, acute appendicitis five times and typhoid fever in four instances.

TABLE 2.—*Differential Diagnosis of 446 Cases Referred as Poliomyelitis (Herman Kiefer Hospital 1928-1931)*

Disease	Number of Cases	Percentage of Total
Poliomyelitis	224	50.2
Nasopharyngitis	66	14.8
Meningococcus meningitis	16	3.6
Otitis media, acute	13	2.9
Tuberculous meningitis	13	2.9
Gastro-enteritis, acute	13	2.9
Tonsillitis, acute follicular	11	2.5
Acute rheumatic fever	9	2.0
Lobar pneumonia	8	1.8
Bronchopneumonia	6	1.4
Appendicitis	5	1.1
Encephalitis	4	0.9
Osteomyelitis	3	0.7
Serum sickness	3	0.7
Scarlet fever	3	0.7
Psychoneurosis	2	0.4
No disease	2	0.4
Influenza	2	0.4
Peripheral neuritis—Bell's palsy	2	0.4
Typhoid fever	2	0.4
Streptococcus meningitis	2	0.4
Pyelitis	2	0.4
Acute generalized miliary tuberculosis	2	0.4
Spastic paraplegia old, acute nasopharyngitis	2	0.4
Exanthem subitum	2	0.4
Traumatic injury of knee	1	0.2
Traumatic injury of hip	1	0.2
Cerebral hemorrhage, hemiplegia	1	0.2
Septicemia	1	0.2
Acute catarrhal jaundice	1	0.2
Poliomyelitis and whooping cough	1	0.2
Acute suppurative mastoiditis	1	0.2
Acute epiphysitis	1	0.2
Whooping cough	1	0.2
Tetanus	1	0.2
Erysipelas	1	0.2
Intracranial hemorrhage of the new-born	1	0.2
Migraine	1	0.2
Malnutrition	1	0.2
Status epilepticus	1	0.2
Bronchial asthma	1	0.2
Syphilitic aortitis	1	0.2
Mucous colitis	1	0.2
Congenital heart disease	1	0.2
Rickets	1	0.2
Acute sinusitis	1	0.2
Pfeiffer bacillus meningitis	1	0.2
Cerebrospinal syphilis	1	0.2
Paratyphoid fever B	1	0.2
Pneumococcus peritonitis	1	0.2
Subacute bacterial endocarditis	1	0.2
Abscess of cervical lymph node	1	0.2
Fracture of skull	1	0.2
Lymphatic leukemia	1	0.2

The frequency with which other conditions are confused with poliomyelitis is well represented by an experience with 446 referred cases. Table 2 illustrates in a practical way the variety of problems in clinical differentiation. Sixty-six patients were dismissed with the diagnosis of nasopharyngitis, because they had a mild general but indefinite infection with symptoms related principally to the upper respiratory tract. A number may well have had abortive poliomyelitis.

CLINICAL PROBLEMS

The statement of the principles of direct and differential diagnosis is a simple matter; their interpretation and application are oftentimes difficult. Actual case histories suffice better than any other method to illustrate practical bedside application.

CASE 3.—William K., a white boy, aged 6 years, became ill on Sept. 19, 1931, with symptoms suggesting a mild nasopharyngitis. His throat was more irritated than sore. The next day he was relatively well. The third day marked a return of symptoms. He vomited once, complained of severe headache and had a fever of 101 F. Vomiting recurred the fourth day, and the fever reached 103 F. He complained now of backache, but no definite stiffness of the spine could be demonstrated. His physician had the impression of resistance when the neck was flexed.

Physical examination demonstrated no abnormalities of the reflexes; the same impression was obtained of indefinite resistance of the neck to forward movement. Lacking more certain evidence, continued observation was recommended with spinal puncture deferred until morning. The temperature at that time was normal, but rose to 100.2 F. in the afternoon. The backache disappeared. No stiffness of the spine or neck developed. The sixth day found the boy apparently returned to normal health. The blood contained 7,600 leukocytes per cubic millimeter, 68 per cent of which were polymorphonuclear cells.

The course of this illness resembled poliomyelitis. The history suggested early involvement of the central nervous system, but the physical signs were not sufficiently definite to warrant lumbar puncture. The case was not reported as poliomyelitis.

The next case history presents an infection somewhat more definite, but still with an element of doubt. No other situation in poliomyelitis offers comparable difficulties in diagnosis, nor so taxes clinical judgment as to management.

CASE 4.—Delmay W., a girl, aged 4½ years, became ill on Sept. 20, 1931. She had fever and complained of headache and pain in the abdomen. She vomited. After this transitory illness, she was free from symptoms until September 23. On the twenty-fourth, she complained of tenderness of the right leg. The patient was admitted to the hospital that afternoon with a fever of 101.6 F., a pulse rate of 126 and a respiratory rate of 25.

Physical examination revealed a well developed, well nourished child, somewhat apprehensive but cooperative, and apparently acutely ill. The skin was warm and moist. No rigidity of the neck and no spine sign could be demonstrated. The tongue was coated, but the mucous membranes of the throat were apparently normal. The heart and lungs were clear. The abdominal reflexes could not be elicited, but all others were present and active. There was no weakness or paralysis of any of the extremities, nor could the previously stated tenderness of the leg be demonstrated. No muscular tremors were observed. Examination of the blood gave 3,630,000 erythrocytes, 70 per cent hemoglobin and 5,300 leukocytes, with 69 per cent neutrophils, 30 per cent lymphocytes and 1 per cent metamyelocytes. The only abnormality elicited by physical examination was an absence of abdominal reflexes. Lacking more concrete evidence, lumbar puncture was postponed. No additional physical signs were noted that evening, but on reexamination the following morning the knee jerks could not be determined, nor could the Achilles jerks be elicited. The abdominal reflexes, absent the day before, were now present but sluggish. There was some resistance of the back to flexion, and the muscles of the right thigh were tender. Examination of the cerebrospinal fluid showed 10 cells per cubic millimeter and a faint trace of globulin. Sugar was present in the proportion of 157 mg. per hundred cubic centimeters of fluid. No precise information was contributed by lumbar puncture, since examination of the cerebrospinal fluid gave neither frankly positive nor negative results.

The infection was so strongly suggestive of poliomyelitis that convalescent serum was administered intravenously. The following day the temperature subsided to normal limits. The knee jerk could now be obtained by reinforcement on the left side, but not on the right. Neck rigidity and stiffness of the spine had disappeared. No paralysis developed, and the patient recovered completely. The case was reported as poliomyelitis.

The next case is easily interpreted.

CASE 5.—Albert W., a boy, aged 5½ years, became ill on Sept. 26, 1931, with the usual symptoms of fever, headache and vomiting. After that he was well for several days, but on September 30 he had a recurrence of headache and vomiting and complained of pain in the back. On the third day of this second illness, October 2, he was admitted to the hospital with a fever of 102.8 F., a pulse rate of 140 and a respiratory rate of 32.

Physical examination revealed a child acutely ill. A vasomotor disturbance was indicated by hyperhidrosis and blotchiness of the skin. The tache cérébrale was readily elicited. The mucous membranes of the throat were mildly injected, and the tongue was coated. No weakness or paralysis of muscle groups could be determined. The superficial and deep tendon reflexes were present and equal, but the neck was moderately stiff and the spine sign definitely and distinctly positive. The Kernig sign was absent, and a test for the Babinski and other plantar reflexes gave the normal response of flexion. Examination of the blood revealed 4,720,000 erythrocytes, 80 per cent hemoglobin, 14,300 leukocytes, 76 per cent neutrophils, 24 per cent lymphocytes and 1 per cent metamyelocytes.

The blood showed a different type of reaction, leukocytosis rather than the leukopenia accompanying a lymphatic infection. Pain in the back, stiffness of the spine and rigidity of the neck gave clearcut indication for immediate lumbar puncture. A slightly hazy fluid containing 330 cells per cubic millimeter was removed under increased pressure. The case was reported as poliomyelitis. Recovery was uneventful except for moderate weakness of the right tibialis anticus.

CEREBROSPINAL FLUID IN EARLY POLIOMYELITIS

Examination of the cerebrospinal fluid aids materially in corroborating preparalytic poliomyelitis and is part of a thorough clinical diagnosis. It is by no means essential. Identification of the infection cannot be accomplished by this measure alone, for the determinations may be within normal limits in the initial period (case 2), and by the usual examination for physical appearance, number of cells and qualitative test for globulin and reducing substances, the fluid may be indistinguishable from that of a number of other pathologic conditions, such as tuberculous meningitis, cerebrospinal syphilis and epidemic encephalitis.

In poliomyelitis the cerebrospinal fluid is usually delivered from the lumbar puncture needle under increased pressure. The precise amount of pressure is not essential for clinical purposes, but can be easily determined by use of the Ayer spinal fluid manometer, and the usual limits are from 150 to 200 mm. The gross appearance of the fluid is of clinical value. Collected in tubes, the fluid should be observed in transmitted light. A normal fluid is clear. The fluid of patients with poliomyelitis is relatively clear, but often presents a slight haziness described as the appearance of ground glass. Other diseases of the central nervous system also have relatively clear fluids. The most common are encephalitis, tuberculous meningitis, cerebrospinal syphilis and meningismus. A definitely cloudy fluid, often with pus, is obtained from patients with purulent meningitis. A fibrin web does not form in the fluid of poliomyelitis, but indicates a chronic infection of the meninges, tuberculous meningitis or the less frequent chronic meningococcus meningitis.

Determination of the number of cells per cubic millimeter is one of the simple yet most valuable laboratory tests. Cerebrospinal fluid is diluted with acetic acid containing a small amount of some dye such as methylene blue (methylthionine chloride, U. S. P.). The dye gives the cells a slight color and makes counting easier. The dilution is made in a white cell blood pipet. The normal range for cells in the cerebrospinal fluid is from 0 to 10 cells per cubic millimeter. The number is increased in the presence of infection. Thus the cerebrospinal fluids in poliomyelitis, encephalitis and tuberculous meningitis, even when relatively clear, contain from 15 to 500 cells. Any value above 10 is significant when substantiated by clinical observations. The usual range in poliomyelitis is from 50 to 100. Some fluids have fewer than 50 cells, while others have as many as 2,000. Cells should be counted promptly on withdrawal, but only if free from red cells which simulate lymphocytes.

The kind of cell in the spinal fluid is of diagnostic aid. In early involvement, neutrophilic polymorphonuclear cells may predominate, but more commonly in this early period cells of the myelogenous and of the lymphatic series are about equally distributed. Shortly lymphocytes predominate, almost to complete exclusion of neutrophils, and this is easily the usual finding in the fluid of patients with preparalytic poliomyelitis. The most satisfactory stains for determining the kinds of cells are those of Giemsa or Wright. The well known Gram stain is useful because it allows a partial differentiation of bacterial species besides a reasonably good cell differentiation. The fluids of encephalitis and poliomyelitis are quite similar, and differentiation of the two conditions must be on a clinical basis. The lymphocyte is the cell usually found in tuberculous meningitis, but in this disease tubercle bacilli may sometimes be demonstrated. The cloudy fluids of meningococcus meningitis or of other septic meningitis are not likely to be confused with those of poliomyelitis. In addition to gross appearance and the presence of pus cells, meningococci or other organisms such as streptococci are readily demonstrated.

Serum globulin of the spinal fluid is increased in most of these conditions. The Ross-Jones test is a simple method of determining the reaction, and consists in adding a layer of saturated ammonium sulphate to the fluid and observing the presence or absence of a white ring at the junction of the liquids. The presence of blood in the spinal fluid invalidates the globulin test.

In the event that syphilis is suggested, it is advisable to request examination of the fluid by the Wassermann test. The Lange colloidal gold test, gum mastic or other similar tests indicate changes in the character of the proteins in spinal fluids. They are useful mainly in syphilitic infections. Poliomyelitis, encephalitis and infectious meningitis give results so alike that the tests cannot be used for distinguishing these diseases. Many of the fluids from patients with poliomyelitis do not differ appreciably from the normal.

The amount of reducing substances (mainly dextrose) in cerebrospinal fluid expressed as milligrams per hundred cubic centimeters of fluid is under normal

conditions from 60 to 80. The determination is made by reducing the alkaline cupric sulphate and dissolving the precipitate in phosphomolybdic acid, which forms a deep blue soluble compound. By comparison of the color with that obtained from a known amount of sugar, the amount in the spinal fluid is determined. The concentration of sugar in the spinal fluid is from 50 to 70 per cent that of the blood. The content of reducing substances in poliomyelitis is usually within the normal value, and thus contributes little to direct diagnosis. The test is of principal value in differentiating encephalitis, a condition in which the sugar content is increased, often exceeding 100 mg. per hundred cubic centimeters. The other condition presenting a clear fluid with predominance of lymphocytes is tuberculous meningitis, and again aid is contributed in differential diagnosis by reason of the fact that any infectious meningitis tends to produce a greatly lowered value of reducing substances, commonly from 30 to 40 mg. and sometimes as low as 10 mg. The outstanding differences are summarized for infectious diseases of the central nervous system having relatively clear cerebrospinal fluids.

SUMMARY

Two benefits accrue from recognition of poliomyelitis in its preparalytic period. The public health is benefited by isolation of affected persons at the earliest possible time. The second advantage is to the patient through early institution of treatment, whether it is carefully prescribed rest in bed, reduction of pressure by drainage of the cerebrospinal fluid or the use of presumably specific measures.

Preparalytic poliomyelitis is a clinical entity distinguishable from similar conditions with relative surety. The facts contributing to clinical recognition have been repeatedly emphasized, and yet practical experience indicates the need for better appreciation generally of the clinical nature of early poliomyelitis. The disease is too often first recognized by the presence of paralysis. Equally unfortunate is the tendency during an epidemic to advance the diagnosis of poliomyelitis for many other and more common diseases of childhood without sufficient critical differentiation. This circumstance leads to unsatisfactory management of conditions that are not poliomyelitis, and to undue alarm about the actual prevalence of the specific infectious disease.

The diagnosis of early poliomyelitis depends on a sound clinical suspicion substantiated by evidence derived from examination of the cerebrospinal fluid. Epidemiologic evidence aids diagnosis, in that cases are more numerous in August, September and October, with young children more affected than other age groups. The symptoms are those of many general infections, including typically a low grade fever, headache and vomiting. Three outstanding physical signs contribute greatest aid. They are stiffness of the neck, rigidity of the spine and ataxic tremor of the extremities.

The diagnosis is primarily clinical. When the evidence suggests poliomyelitis and other possibilities have been eliminated, confirmation is effected by lumbar puncture at the proper time. The cerebrospinal fluid in poliomyelitis is essentially clear, rarely of greater turbidity than slight haziness. Laboratory differentiation thus resolves into distinguishing infections of the central nervous system characterized by clear fluids.

TABLE 3.—*Examination of Spinal Fluid*

	Appearance	No. of Cells	Predominant Cells	Sugar, Mg. per 100 Cc.	Bacteria
Normal.....	Clear	0- 10	Lymphocytes	60- 80	None
Poliomyelitis....	Clear or slightly hazy	15-500	Very early, neutrophils; later, lymphocytes	50- 80	None
Encephalitis.....	Clear	15-500	Lymphocytes	70-110	None
Tuberculous meningitis	Clear; fibrin web	15-500	Lymphocytes	10- 60	Present
Purulent meningitis	Purulent	500-20,000	Neutrophils	10- 60	Present
Syphilis, cerebrospinal	Clear	10-500	Lymphocytes	10- 60	None

IMMUNITY TO POLIOMYELITIS IN THE GENERAL POPULATION

PROBABLE MECHANISM OF PRODUCTION

S. D. KRAMER, M.D.
BOSTON

Immunity to poliomyelitis, as indicated by neutralization tests, has been shown to be widespread. A notion of the mechanism through which it comes about may be gained from a consideration of the rapidity with which it develops in reference to age and concentration of population. Infants born of immune mothers are immune to poliomyelitis for at least the early months of life:[1] The age distribution of the disease and neutralization tests show that this immunity is lost by the end of the first year. The age distribution further indicates an increasing immunity in the population with increasing age. Neutralization tests on persons of different ages have shown that nine tenths of urban persons become immune by the time adult life is reached.[2] The marked discrepancy between the amount of immunity to poliomyelitis in urban and in rural populations suggests that its extent and rapidity of development are related to the concentration of population in direct ratio to the opportunities for contact.

The mechanism involved in the immunization against certain other diseases is readily understood. In measles, for example, immunity is conferred only through an attack of the disease: in the course of a lifetime, the majority of persons have measles. With diphtheria, the source of a similarly widespread immunity is not so obvious, but Schick tests show that most persons acquire immunity to the disease without having a recognized attack. This widespread immunization is accounted for by a carrier rate sufficient to "saturate" the population in the course of the first twenty years of life.

Since the incidence of poliomyelitis is roughly one-hundredth that of diphtheria, the explanation of a similarly widespread immunity in the former disease is

From the Department of Preventive Medicine and Hygiene, Harvard Medical School.

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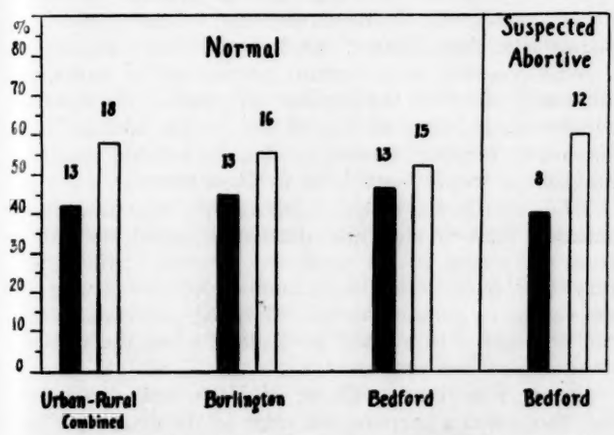
1. Aycock, W. Lloyd, and Kramer, S. D.: Immunity to Poliomyelitis in Mothers and the New-Born as Shown by the Neutralization Test, J. Exper. Med. **52**: 457 (Oct.) 1930.

2. Aycock, W. Lloyd, and Kramer, S. D.: Immunity to Poliomyelitis in Normal Individuals in Urban and Rural Communities as Indicated by the Neutralization Test, J. Prev. Med. **4**: 189 (May) 1930.

even less apparent. The problem is further complicated by the absence of cultural methods for the detection of carriers or a simple test to determine immunity. Although the neutralization test is not complex, venipunctures and expensive animals are necessary to carry it out. Thus, the number of neutralization tests has not been large, but their concordance with other epidemiologic studies and similar studies in other diseases, such as diphtheria, has given significance to the figures. From such studies it seems fairly evident that the distribution of the virus of poliomyelitis must be as widespread in the general population as that of Corynebacterium diphtheriae and the causative agent of measles.

It remains to be demonstrated by precisely what mechanism this widespread immunity in poliomyelitis is accomplished. Since the frank recognizable disease can account for only a small part, it would appear that in the majority of persons this is a result either of mild (abortive) forms of the disease or of healthy carriage of the virus.

There is a feeling prevalent among physicians that there are large numbers of mild abortive forms of



Results of neutralization test for immunity to poliomyelitis in children from 5 to 15 years of age. The black column represents the children whose serums neutralized; the white column, those who failed to neutralize. (From Kramer, S. D.: Present Status of the Control of Poliomyelitis, M. Times & Long Island M. J. **59**: 409 [Dec.] 1931.)

poliomyelitis, particularly in the course of epidemics of the frank disease. The inference to be drawn from this belief is that much of the widespread immunity in the normal population comes about through these abortive attacks.

A recent survey [3] in a small town in Massachusetts where 5 cases of poliomyelitis occurred (total population about 1,500) revealed 33 cases of mild illness in children with such symptoms as headache, fever and vomiting without apparent cause. In proximity to frank cases these illnesses could have been abortive poliomyelitis. Tests for a neutralizing substance were made on these children several months after the illness, and it was found that the number who were immune was no greater than in a similar group of children of the same age in the same town who had had no illness. A like number of children of the same ages from an adjacent town who had been free from poliomyelitis showed the same proportion of immunity. These results indicate that the children who were ill did not suffer from poliomyelitis, or in any event that the infection did not confer immunity to the disease. The results of this study are summarized in the accompanying chart.

This study further suggested that the process of immunization may go on in the absence of an outbreak, in a more or less uniform manner throughout the year, or in interepidemic periods. Although it is reasonable to suppose that the virus may be disseminated more rapidly at the time of an outbreak, the low incidence of poliomyelitis does not permit the assumption that cases are the sole source of the virus and would not account for the widespread immunity. Contact with a case would increase the chance of obtaining the virus, but the assumption of a carrier factor in the dissemination process must be made. The fact that the virus has been found in the nose and throat of patients and contacts would support such an assumption, even though the number of such tests is small, owing to technical difficulties.

TABLE 1.—*Immunity in Susceptible Persons Following Intimate or Prolonged Contact with a Patient with Poliomyelitis*

Name	Age, Years	Contact		Result of Neutralization Test	
		Nature of	Duration	At Time of Contact	Five Months Later
A. S.	15	Intimate	4 days	Failed to neutralize	Neutralized
R. M.	7	Intimate	Continuous	Failed to neutralize	Neutralized
E. M.	9	Intimate	Continuous	Failed to neutralize	Neutralized
S. P.	9	Prolonged	7-10 days	Failed to neutralize	Neutralized
N. M.	7	Prolonged	7-10 days	Failed to neutralize	Neutralized
G. D.	4 10/12	Prolonged	7-10 days	Failed to neutralize	Neutralized

The intimate contact with a person harboring the virus may result in immunization without any recognizable symptoms of the disease is suggested by the following study. Twelve persons were selected from a group of twenty-three who had been in intimate or prolonged contact with a patient with poliomyelitis. A preliminary neutralization test of the entire group made within a few days following termination of the contact showed the twelve to be nonimmune. Six of the twelve were available for retesting after five months; they were found to be immune. The results are summarized in table 1.

TABLE 2.—*Absence of Immunity in Susceptible Persons Following Indirect or Casual Contact with a Patient with Poliomyelitis*

Name	Age, Years	Contact		Result of Neutralization Test		
		Nature of	Duration	At Time of Contact	3½ Months Later	5 Months Later
L. S.	6	Casual	Several hours	Failed to neutralize	Failed to neutralize	
E. B.	8	Casual	Several hours	Failed to neutralize	Failed to neutralize	
R. J.	8½	Casual	Several hours	Failed to neutralize	Failed to neutralize	
W. L.	7	Indirect	Several hours	Failed to neutralize	Failed to neutralize	
R. L.	5	Indirect	Several hours	Failed to neutralize	Failed to neutralize	
M. C.	17	Casual	3 days	Failed to neutralize	.....	Failed to neutralize

The nature of the contact in these cases is of some interest. In the first three subjects it was not only

3. Kramer, S. D., and Aycock, W. Lloyd: Abortive Poliomyelitis, Proc. Soc. Exper. Biol. & Med. **29**: 98 (Oct.) 1931.

prolonged, but intimate: A. S., a dear friend, had kissed the patient; A. M. and B. M., brother and sister of the patient, were in continuous contact and had exchanged chewed gum with the patient. The next three subjects, P., M. and D., were in contact with a patient in a convalescent home for a period of from seven to ten days prior to the onset of the disease. These children played together, slept in the same quarters and ate at the same table. At no time during these five months did the persons who developed immunity suffer from any illness that could be suspected as being abortive poliomyelitis.

Another group of cases indicated that brief casual contact may not result in the transfer of the virus and subsequent immunity. Neutralization tests on fifteen persons several days following contact showed eight to be nonimmune. Six of these who were available for retesting three and a half and five months later failed to develop immunity. The results are summarized in table 2.

The first five of this group were fellow guests at a birthday party with a child who twenty-four hours later developed acute symptoms of poliomyelitis. All were accompanied by nurses or their mothers, and two arrived after the patient had left. The last child whose case is cited in table 2 (M. C.) spent three days with the patient at a week-end party, but was not intimate with her. This girl was tested a third time eight months following exposure and still failed to neutralize the virus.

In the first group the intimacy of contact was sufficient to render highly probable the transfer of oral secretion. Such was not the case in the second group, in which the contact was supervised, brief and more formal. A follow-up of the two groups revealed no later contact with a patient or any illness remotely suggestive of poliomyelitis and no illness within a period of from four to six weeks following exposure. Thus, immunity developed in the group of contacts in which the degree of exposure was such as to render more likely the transfer of secretion from the upper respiratory tract.

Although the number of contacts in which immunity resulted is small, the results suggest the probable mechanism through which immunization of the population may take place. There is ample evidence that the neutralizing substance found in the blood serums of the tested persons, is specific and is the result of exposure to the virus of poliomyelitis. For example, normal monkey serums do not contain such substances, whereas the serums of convalescent monkeys, monkeys actively immunized and human convalescents constantly develop the power to neutralize the virus. Such immunity, as is found in other diseases, has never been demonstrated when exposure to the virus of poliomyelitis could be positively excluded.

The evidence presented indicates that immunity may follow exposure to the virus without evidence of disease. Furthermore, an explanation has been suggested for the widespread immunity to poliomyelitis similar in mechanism and extent to that of diphtheria. It would seem, however, that further search for the underlying factors that determine the outcome of exposure to the virus in the two types of persons, immunity in one and disease in the other, might more nearly approach the solution of the problem, the control of poliomyelitis.

THERAPEUTIC USE OF ANTIPOLIOMYELITIS SERUM IN PREPARALYTIC CASES OF POLIOMYELITIS

WILLIAM H. PARK, M.D.
NEW YORK

It is now definitely decided that poliomyelitis is due to a true filtrable virus. This is of extreme importance since no disease due to a filtrable virus is known that can be benefited by an antiserum after clinical symptoms have developed. As one reads of the attempts made to cure the disease, one notes that at first the serum was advocated, not only in recently paralyzed persons but in those in whom the paralysis had existed for some days. Thus in France, Netter, in 1915, treated intraspinally thirty-two persons after paralysis had developed and was enthusiastic about the results. Eight of the thirty-two patients died. They had the bulbar type of paralysis. In America, Zingher, in 1916, treated eighty-eight patients at the Willard Parker Hospital. Thirty-eight of these patients died. At the Minturn Hospital he treated eighteen patients who were already paralyzed. Fifteen recovered. Zingher was less enthusiastic than Netter, but believed that "the serum showed possibly, in a certain proportion of cases, an inhibitory effect on the further progress of the disease, which resulted in a saving of life." He added, "it is difficult to forecast, however, what the natural result of the disease would have been in these cases."

Neal, also in the research laboratory, who saw many patients, both treated and untreated, noted no effects from the serum on the paralyzed persons. Since then, very few have seriously recommended the giving of the serum to persons already showing paralysis, but it has been given to a small percentage when the persons or their families requested it.

Before the great epidemic of 1916, few recognized that there was a preparalytic stage in the disease, which could at times at least be diagnosed. It was believed that the majority of these cases progressed to paralysis. In the 1916 epidemic, Zingher treated fifty-four patients in the preparalytic stage with one or two intraspinal injections of serum. Forty-four of these (81.4 per cent) recovered without paralysis, while five developed marked, and five slight, paralysis. His comment on the outcome in these cases in which serum was used was:

> It is known that in poliomyelitis we have a group of abortive nonparalytic cases in patients who go through the premonitory symptoms, but do not develop paralysis. It is difficult to state, therefore, how many of the patients treated with serum would have remained free from paralysis without serum treatment. . . . It seems to me, however, that the action of serum in poliomyelitis is beneficial and that human serum is indicated in the treatment of the acute stages, especially in the preparalytic period of the disease.

Neal, watching treated and untreated persons in the preparalytic stage seen in consultation during this same epidemic, formed the opinion that the treated patients did no better than the untreated. She also feared that the increased fever and the marked cellular response of the cerebrospinal meninges in the presence of the serum might be harmful, at least in some cases.

From the Research Laboratory, Department of Health.
Read before the Section on Pathology and Physiology at the Eighty-Third Annual Session of the American Medical Association, New Orleans, May 12, 1932.

In 1928, Aycock and Luther reported 106 cases of poliomyelitis in which treatment was given in the preparalytic stage. They used, for the administration of the serum, the combined intraspinal and intravenous routes. The mortality was only 0.92 per cent, while in cases first seen in the stage of paralysis and in which no serum was given, it was 14 per cent. Paralysis did not develop in 36 per cent of the cases in which treatment was given. The authors believed that these results were favorable.

McEachen and his co-workers reported the results of treatment in 107 cases that occurred in 1929 in Manitoba. They gave the serum intramuscularly. The dose was also small, being often but 25 cc. In almost 94 per cent of the cases paralysis did not develop. They concluded that the serum was of value in the preparalytic stage.

In the *Lancet* of Feb. 27, 1932, there is a report by Macnamara and Morgan [1] on the use of serum in an outbreak of poliomyelitis in Australia. One hundred and thirty-three persons were treated in the preparalytic stage. The authors' decision was that the serum gave excellent results. Here, as in all the other cases, there were no controls to compare with the treated patients, as the physicians felt that they had no right to exclude any person in the preparalytic stage from receiving the serum.

In 1931, Shaw, Thelander and Limpos reported on the use of serum in the preparalytic and paralytic stages. Of the fifty-three patients treated before the onset of paralysis, 84.4 per cent remained free from permanent paralysis, while of the thirty-nine treated after the development of paralysis, only 23 per cent remained free.

The death rate in the first group is 1.9 per cent and in the second, 18 per cent.

Shaw, in his article on early treatment in the booklet on "Practical Suggestions Regarding Poliomyelitis," supplied for the scientific exhibit prepared for the American Medical Association, states on page 24 reasons for caution in accepting the evidence obtained from treating patients without controls. They are, in my opinion, so weighty that I feel justified in quoting them:

> In table 3 are presented the results of convalescent serum therapy given by a number of observers. From this it can be seen that the view that the method is of probable value resulted from each set of observations. Such an opinion should be viewed with respect, but results are far from conclusive statistically, especially because of the almost insuperable difficulty in properly controlling clinical trials of this nature. It is, of course, possible for one's opinion to be influenced by the apparent effect on occasional cases treated with certain highly specific serums, without numerical results being conclusive. The most glaring error into which one is tempted to fall is the comparison of end-results in a series of treated cases with an untreated group selected at large, which latter group may fail to account for many mild or abortive unreported cases. In other words, cases which are diagnosed on the basis of early symptomatology and treated with serum must not be compared, as regards end-results, with those in which paralysis was the diagnostic criterion.
>
> The clinician must maintain a strictly critical attitude toward the study of results and be prepared later to abandon such treatment in the not altogether unlikely event that its utility be finally conclusively disproved. The clinical point of view must remain one of thoughtful inquiry rather than eager acceptance or impatient rejection of the method.

Before taking up the results obtained by the health department inspectors and the pediatricians serving the New York Academy of Medicine, I shall consider the important communication of Kramer, Aycock, Solomon and Thenebe.[2]

The authors note that their earlier studies were not adequately controlled, and that a study of alternate series is essential to establish the value of convalescent serum. Such a study is not feasible under the conditions in Massachusetts; it should be made where opinion is divided as to the value of serum or where the supply of serum is insufficient for all the cases diagnosed in the early stage.

The epidemic in 1931 in Brooklyn and in Connecticut offered suitable conditions. The authors studied in a hospital in Brooklyn and also one in Hartford patients treated in the preparalytic stage, and a similar untreated group. Of eighty-two patients studied in the preparalytic stage, approximately half had received human convalescent serum by the intravenous and intraspinal routes. No patient was accepted for study if his illness had lasted more than three days on admission to the hospital; careful physical examination was made, including the testing of all muscle groups to eliminate cases with weakness. All cases reported showed the physical and spinal fluid findings of preparalytic poliomyelitis. The patients treated were given convalescent serum immediately on admission to the hospital. The dosage was 60 cc. given intravenously at the first sitting, and 40 cc. intraspinally in two sittings, from eight to twelve hours apart.

A second muscle examination was made, usually within from twenty-four to forty-eight hours after admission, and again before discharge, usually from two to three weeks later. At the end of the study a complete muscle examination was done on all of the patients.

Of the eighty-two patients studied in Brooklyn and Hartford, forty-two, or 51 per cent, developed some paralysis; this was about evenly divided between the two cities. Two deaths from respiratory paralysis occurred in the treated group of patients, one in each city. In the remaining cases, the average paralysis for the treated group in Brooklyn and Hartford combined was 12.1, and for the untreated group, 5.9. The average paralysis per case in the treated group in Brooklyn was 1.4; in the untreated, 4.3. In Hartford the average paralysis in the treated group was 20.4, whereas the untreated group showed an average of 4.3.

The proportion of cases in which paralysis developed in Hartford and Brooklyn was about the same, but the outcome was different. This difference is due to the including of a relatively small number of severely paralyzed patients in the Hartford group. In Brooklyn, when the outcome in the treated group is compared with that of the parallel untreated group, the weight of evidence is with the former. In Hartford, because of the five badly paralyzed patients, the results are reversed and the untreated group is favored. The outcome in cases with respect to the day of illness on which the patient received treatment seemed to give some indication that the irregular results in Hartford might be accounted for by the lateness of the treatment in several of the patients who developed severe paralysis, but no statistical deduction could be made. These cases had been included on the same basis as others, and the

1. Macnamara, Jean, and Morgan, F. G.: Poliomyelo-Encephalitis in Victoria (1925-1931): Treatment by Human Immune Serum, Lancet 1: 469 (Feb. 27) 1932.

2. Kramer, S. D.; Aycock, W. L.; Solomon, C. I., and Thenebe, C. L.: Convalescent Serum Therapy in Preparalytic Poliomyelitis, New England J. Med. **206**: 432 (March 3) 1932.

irregularity can be ascribed only to chance variation in a limited number of cases in a relatively mild outbreak.

The authors conclude that this therapeutic test of serum more nearly approaches a controlled experiment than any they have previously made; that no statistical evidence was obtained that convalescent serum is effective, but that the reverse conclusion—that it is of no value—may not be drawn. They state that the outcome of this study of controlled cases justifies its continuation on a larger scale.

SERUM TREATMENT IN PREPARALYTIC CASES OF POLIOMYELITIS IN NEW YORK CITY DURING THE 1931 OUTBREAK

As soon as the health department was notified of a case of poliomyelitis, it was reported to its research laboratory. A physician almost immediately went to see the patient, and if the symptoms indicated that the condition was poliomyelitis, he withdrew a specimen of spinal fluid and transported it to the laboratory. Usually within one hour a report was telephoned to the family physician. He was consulted as to whether the patient should remain at home or go to one of the hospitals designed to receive such cases. If the child was to remain at home, he was asked whether he wished to have serum given and if he were willing to meet one of the pediatricians working under the Poliomyelitis Committee of the Academy of Medicine. The great majority of all the patients were seen either by one of these men or by the resident physicians of the hospitals caring for patients with contagious diseases.

The serum was supplied by the health department. The Academy of Medicine provided the money to pay the donors of convalescent serum.

The other members of the Poliomyelitis Committee of the Academy of Medicine agreed with me that we should study the course of the disease in the children who did not receive serum as carefully as the course in those who did. Dr. Flexner was chairman of the committee. At first it was decided to treat alternate patients at the hospitals, but it soon became evident that the great majority of those in the preparalytic stage remaining at home were receiving the serum, so as we had grave doubts as to the value of the serum and wished to have an equal number of controls, we stopped using it in the hospitals.

In order to test the comparative value of the different methods of giving the serum, we administered it to some of the patients by what we might call Aycock's method of combined intraspinal and intravenous injections, and by the Canadian method of subcutaneous injection. We also treated a considerable number of patients by the intravenous method alone or combined it with the intramuscular injection.

The total dosage also varied from a minimum of 25 cc. to a maximum of 100 cc. We have carefully taken records as to the day of the disease at which the case was seen, its apparent severity, when serum was given and the time of the first injection.

The presence of paralysis and, if present, its amount was noted at the end of three weeks and again after a period of from five to six months. The amount of paralysis was noted and recorded at this time, but this was not done in as much detail as recommended by Aycock. Full reports will be made in a few weeks by the Academy of Medicine, and at a later period by the department of hospitals.

COMMENT ON TABLES

In this study we were able to obtain the doctor's opinion on the great majority of the treated and untreated patients, as shown in table 1. The treated group cared for by the pediatricians were on the average classified as having a trifle more severe cases than the untreated group, but this difference was not apparent in the large number of untreated hospital patients used for comparison.

TABLE 1.—*Comparison of Final Outcome with Physician's Estimate of Severity of Illness; Treated Preparalytic Group* *

Later Final Outcome	Doctor's Classification at First Visit: Mild	Fairly Ill	Very Ill	Dangerously Ill	Total
0	108	187	33	1	329
I	15	14	7	0	36
+	8	32	4	0	44
++	6	13	12	0	31
+++	0	12	7	0	19
Died	2	4	9	3	18
Total	139	262	72	4	477
Per Cent	29.1	55.0	15.1	0.8	100

* Quoted by permission of the Academy of Medicine. 0 indicates no weakness; I, weakness; +, paralysis of one muscle, and ++, paralysis of several muscles, and +++, paralysis of many muscles.

TABLE 2.—*Day of Treatment and Outcome* *

Outcome	0	I	+	++	+++	Died	Total	
	Per Cent of Cases	Per Cent of Cases	Per Cent of Cases	Per Cent of Cases	Per Cent of Cases	Per Cent of Cases	No. of Cases	Per Cent
1	73.8	6.0	6.3	6.7	4.4	2.8	252	100
2	62.1	8.1	13.0	8.1	3.7	5.0	161	100
3	66.6	13.9	11.1	2.8	2.8	2.8	36	100
4	68.8	12.5	12.5	0	6.2	0	16	100
5	100.0	0	0	0	0	0	2	100

* Quoted by permission of the Academy of Medicine. The day of treatment is calculated from the date of the meningeal symptoms.

TABLE 3.—*Comparison of Methods, Including Intraspinal and Others* *

Outcome / Intraspinal Method	0	I	+	++	+++	Died	Total	
	Per Cent of Cases	Per Cent of Cases	Per Cent of Cases	Per Cent of Cases	Per Cent of Cases	Per Cent of Cases	No. of Cases	Per Cent
Intraspinal-intravenous	70.0	6.7	6.7	4.4	7.8	4.4	90	100
Intraspinal-intramuscular	71.2	5.4	9.3	7.3	4.4	2.4	205	100
Intraspinal-intravenous-intramuscular	69.0	3.5	13.8	10.3	0	3.4	29	100
Total per cent in group treated	70.7	5.5	9.0	4.9	4.9	3.1	324	100
Method Other Than Intraspinal								
Intravenous	66.7	0	33.3	0	0	0	6	100
Intramuscular	61.9	16.6	8.3	6.0	1.2	6.0	84	100
Intravenous-intramuscular	69.8	6.4	9.5	6.3	3.2	4.8	63	100
Total of group not treated intraspinally	65.3	11.8	9.8	5.9	2.0	5.2	153	100

* Quoted by permission of the Academy of Medicine.

In a consideration of the days of treatment and the outcome, as shown in table 2, those persons treated on the first day of their meningeal symptoms showed somewhat better results than those treated later in their illness; still, even those in whom treatment was delayed showed remarkably good results. The results in the untreated patients were, however, equally good.

As shown in table 3, the method of giving the serum made no appreciable difference in the outcome. Those who received it intramuscularly developed in a larger percentage some weakness, yet it was of a very mild form.

The results in patients treated with convalescent serum by the pediatricians working under the Poliomyelitis Committee of the Academy of Medicine are almost identical with the results in those receiving only the usual treatment (table 4). Note the comments on table 1.

TABLE 4.—*Comparison of Results in Treated and Untreated Patients* *

	On Discharge				Follow-Up (3 or More Months Later)			
	Treated		Untreated†		Treated		Untreated†	
Status	No.	Per Cent	No.	Per Cent	No.	Per Cent	No.	Per Cent
0	329	69.0	72	70.6	346	78.6	83	84.7
I	36	7.5	12	11.7	40	9.1	8	8.1
II	44	9.2	7	6.9	28	6.4	4	4.1
III	31	6.5	5	4.9	17	3.9	3	3.1
IV	19	4.0	4	3.9	8	1.8	0	0
Died of poliomyelitis	16	3.8	2	2.0				
Total followed	475	100.0	102	100.0	439	100.0	98	100.0

* Quoted by permission of the Academy of Medicine.
† No serum given.

A careful study of the results given in table 5 discloses the fact that there certainly is no statistical evidence of any difference between the serum treated and untreated patients with preparalytic poliomyelitis as observed by the pediatricians serving under the Poliomyelitis Committee of the Academy of Medicine and by those observing the cases in the hospitals for communicable diseases in the city. The slight difference in favor of the untreated patients may readily be attributed to the accidental inclusion of a somewhat larger number of graver infections in the treated patients.

TABLE 5.—*Comparison of Percentage of Paralysis and Deaths in Treated and Untreated Preparalytic Poliomyelitis*

	Total Cases	No Paralysis or Weakness at End of 3 Weeks	Weakness	Paralysis	Died
Controls Untreated by Serum					
Observed by health department and city hospitals pediatricians	306	229 (74.8%)	46 (15%)	29 (9.9%)	2
Observed by Academy of Medicine pediatricians	102	72 (70.5%)	12 (11.7%)	16 (15.6%)	2
Combined totals	408	301 (73.7%)	58 (14.2%)	45 (11.0%)	4 (0.9%)
Patients Treated with Convalescent Serum					
Observed by health department and city hospitals pediatricians	95	72 (75.7%)	10 (10.5%)	10 (10.5%)	3
Observed by Academy of Medicine pediatricians	424	285 (67.2%)	30 (7%)	92 (21.7%)	17
Combined totals	519	357 (68.8%)	40 (7.7%)	102 (19.6%)	20 (3.8%)
Total of all cases	927				

The fact of the increased meningeal irritation caused by the intraspinal injection of serum might conceivably have some effect, but this is not statistically proved.

The figures given in table 5 are disappointing to those who hoped that the serum would demonstrate its value statistically.

Some of us were hardly surprised for we knew that antiserums have been of little or no value in other diseases known to be due to filtrable viruses. These tend to invade the cells themselves and seem then to be beyond the curative reach of the serum.

Not one of the pediatricians who treated these patients felt that he had seen any evidence of a curative influence of the serum. The more detailed statistics which are to be published later will not alter the general impression given by those in table 5.

Dr. Alfred Fisher and Dr. Milton Levine assisted in collecting these statistics.

CONCLUSION

The results of the observation on treated and untreated patients in the preparalytic stage of poliomyelitis during the 1931 outbreak do not give any statistical proof that the serum has any value when given in cases after the cells of the central nervous system are involved.

The fact that the report of Kramer, Aycock and their co-workers, which also deals with patients treated with serum and those not treated, gives similar results is of great importance.

Nevertheless, the uniformly optimistic opinions of those who have not observed untreated patients for a comparison cannot be entirely disregarded.

It would seem that in the future it could be arranged to have both the treated and the untreated patients observed by impartial judges so that a final correct judgment might be formed and generally accepted.

POLIOMYELITIS IN THE STATE OF NEW YORK IN 1931

A PRELIMINARY REPORT OF A STUDY OF 1,559 CASES

FRANK W. LAIDLAW, M.D.
District State Health Officer, State Department of Health
MIDDLETOWN, N. Y.

The increase in the incidence of poliomyelitis in upstate New York in 1931, as in the outbreak of 1916, followed closely on an increase in the number of cases occurring in the city of New York. Prior to July 1, 31 cases had been reported in the state, exclusive of the city, and 35 cases in the city.

During July there was a marked increase in the number of cases reported in New York City—195 cases during the week ending July 25, 155 of which were in the Borough of Brooklyn, where the 1916 outbreak began. Forty-seven cases were reported during July from the state, exclusive of New York City. It is worthy of note that 40 of these cases were in the counties of the Hudson River valley or on Long Island, sections intimately connected with the city, either by forming parts of the commuting area or by serving as its summer resort and recreational region.

Early in August (chart 1) the outbreak had assumed epidemic proportions upstate, over an area that includes that part of Long Island not forming a part of the greater city. Five hundred and thirty-five cases were reported during August, 773 cases in September, 471 in October, 143 in November and 51 in December. The total for the last six months of the year, the period cov-

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ered by the outbreak was 2,020, and the total for the year, 2,051.

It will be noted that the peak for New York City occurred in the first week of August, while that for the upstate portion of New York did not arrive until the first and third weeks of September. The peak in the counties near New York City, particularly those included in the summer resort section, practically coincided with that for the city, rather than with the peak for the upstate portion as a whole.

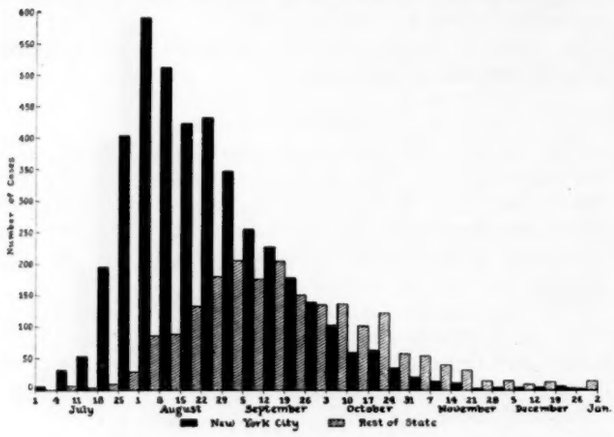

Chart 1.—Cases of poliomyelitis in New York City and State reported by weeks, July 1, 1931, to Jan. 2, 1932.

Of the upstate cases (chart 2), 1,559, or 77 per cent, occurred in 16 counties constituting the greater part of the Hudson River valley and that part of Long Island outside of New York City. These counties contain 36 per cent of the population of the state, exclusive of New York City. Scattered cases occurred, however, in every county of the state except Orleans, in the northwestern part. Eight hundred and sixty-one cases, nearly 43 per cent of the entire number in the outbreak, occurred in three counties: Nassau, 278; Suffolk, 308, and Westchester, 275. The first two constitute the part of Long Island not included in New York City; the third adjoins the city on the north.

TABLE 1.—*Cases Classified by Age, Sex and Condition at Time of Diagnosis and Report*

Age Groups, Years	Cases		Sex		Condition at Time of Diagnosis and Report			
					Paralyzed		Preparalytic Stage	
	Number	Percentage of Total	Male	Female	Number	Percentage of Group	Number	Percentage of Group
All ages	1,559	100.0	898	661	676	43	883	57
0 to 4	560	35.9	312	248	329	59	231	41
5 to 9	528	33.9	320	208	173	33	355	67
10 to 14	255	16.4	162	93	81	32	174	68
15 to 19	118	7.5	69	49	56	47	62	53
20 and over	98	6.3	35	63	37	38	61	62

During November, December and January, a special study was made of this group of 1,559 cases, for the purpose of determining the condition with reference to paralysis or muscle weakness after the subsidence of the acute stage. So far as possible all the patients were visited and examined by a physician of considerable experience with the disease and with the methods of determining slight degrees of paralytic involvement. Valuable work along this line was done by Dr. M. R. French, epidemiologist of the state department of health.

Table 1 shows the cases in the series studied classified in groups by age, sex and the condition as to paralysis at the time of diagnosis and report.

Never before have facilities for scientific diagnosis of the disease been made so generally available to the people of every part of the state of New York. Consultants were provided in every county, prepared to make lumbar punctures in suspected cases, to examine the spinal fluid at the bedside and to administer human immune serum when indicated. The larger cities and county departments of health supplied this service for their jurisdictions, while smaller cities, villages and rural sections were served by sixty consultants temporarily supplied by the state department of health, and by members of the staff of the state department. This force made it possible to provide the most remote rural sections with expert service that heretofore had been available only in large cities.

One of the results of this consultant service was the diagnosis of a far greater proportion of cases in the preparalytic stage of the disease than ever before in the history of the state. It will be noted that 883, or 57 per cent of the cases in this series, were diagnosed and reported as poliomyelitis before the occurrence of paralysis. In these 883 cases the diagnosis, with very few exceptions, was based on an examination of the spinal fluid, in addition to suggestive clinical symptoms.

Attention has been directed to the increase in recent years of cases in the older age groups, with a relative decrease in the group under 5 years.[1] Our figures for this series confirm the findings of Dr. Wells.

It will be noted that the first four five-year periods of life show percentages of 36, 34, 16 and 7.5, respectively, while the cases in patients over 20 years of age constitute 6.3 per cent of the total. The percentage of cases in the group under 5 years of age in this series is about one half that for the same age group in the outbreak of 1916, while all of the other age groups show marked increases.

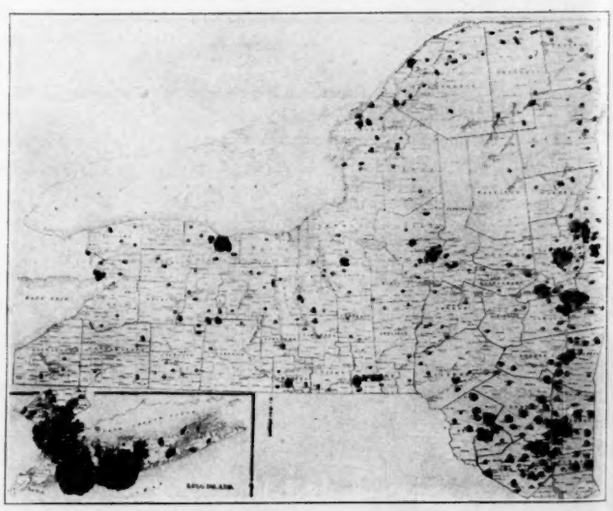

Chart 2.—Distribution of cases of poliomyelitis, 1931, State of New York, exclusive of the City of New York. (A different colored pin was used for each month; certain pins photographed white.)

In connection with one of the suggested explanations quoted by Dr. Wells, that better diagnosis might be a factor, attention is directed to the percentage of cases

1. Wells, M. W.: Recent Age Trends in Poliomyelitis, New York State J. Med. 32: 393 (April 1) 1932.

in each group diagnosed in the preparalytic stage. The four older groups show percentages of 67, 68, 53 and 62, respectively.

A marked reduction in the fatality due to poliomyelitis is one of the important and outstanding features of the 1931 outbreak in upstate New York.

In 1916, during the epidemic, 901 deaths occurred among 4,215 reported cases—a fatality rate of 21.4 per cent. In 1931, 2,051 cases were reported, with 164 deaths, a fatality rate of 8 per cent, the lowest recorded in the state. The rate unquestionably has fallen, but probably not to the extent indicated by the difference between the two rates. The diagnostic facilities made available in 1931 resulted beyond any doubt in the diagnosis and report of a proportionately greater number of cases than in 1916.

be expected, to a limited extent, for patients already paralyzed.

Table 2 gives the results at the time of examination in 1,337 cases. In 734 of these the diagnosis was made in the preparalytic stage, while 603 patients were paralyzed at the time of diagnosis.

Cases the outcome of which it has not been possible to ascertain with reasonable accuracy have been excluded from the totals. The findings paralysis, weakness and complete recovery in cases in which the diagnosis was made in the preparalytic stage were determined by physical examinations made by the investigator.

The fatality rate for the group whose condition was diagnosed in the preparalytic stage was 3.5 per cent; 7 per cent were paralyzed to some degree; 12.4 per cent

TABLE 2.—*Cases Analyzed by Condition at Time of Diagnosis and Use of Serum*

Condition at Time of Diagnosis and Use of Serum	Number of Cases Analyzed	Deaths		Paralysis		Weakness		Complete Recovery		Outcome Unknown, Not Included in Total
		Number	Percentage of Cases	Number	Percentage of Cases	Number	Percentage of Cases	Number	Percentage of Cases	
Preparalytic										
Serum, 30 cc. or less	98	4	4.1	1	....	11	....	82	83.7	(10)
Serum, 30 to 60 cc.	381	13	3.4	26	....	46	....	296	77.7	(50)
Serum, over 60 cc.	205	6	2.9	20	....	26	....	153	74.6	(18)
Serum, amount unknown	5	1	....	0	....	2	....	2	....	(2)
Total	689	24	3.5	47	6.8	85	12.3	533	77.4	(80)
No serum	45	2	4.4	5	11.1	6	13.3	32	71.1	(28)
Total	734	26	3.5	52	7.1	91	12.4	565	77.0	(108)
Paralytic										
Serum given	242	47	19.4	81	....	69	....	45	18.6	(13)
No serum	361	54	15.0	163	....	111	....	33	9.1	(59)
Total	603	101	16.7	244	40.5	180	29.9	78	12.9	(72)
Grand total	1,337	127	....	296	....	271	....	643	....	(180)

In our sample series, at the time of diagnosis and report, as before stated, 883 cases, or 57 per cent of the group, were in the preparalytic stage. During the 1916 outbreak, paralysis was the determining factor in the diagnosis of practically all the reported cases, absence of paralysis, or as it was then termed, the "abortive" case, being almost a negligible factor.

While it is true that the fatality rates for 1916 and 1931 are not comparable, because the totals of reported cases on which they must be computed are obviously not similar, it is also true that hypothetic rates computed, for example, on the ratio of paralyzed patients to deaths, will still show a reduced fatality rate for 1931. One can only speculate on the reasons for the lower fatality rate during the recent epidemic. Any one of several factors may have been operative alone or in combination: 1. The virus may have been less virulent. 2. The earlier diagnosis and better general medical and nursing care and the large use of hospital treatment may have been responsible. 3. The use of serum may have produced the more favorable result.

Realizing that human convalescent serum appeared to offer the best hope of combating the disease, the New York State Department of Health, through the Division of Laboratories and Research, prepared to make available a supply sufficient to meet the emergency. More than 140,000 cc. of serum was collected from persons who had previously suffered from the disease. The distribution was so arranged, through departments of health in counties and large cities and through the offices of district state health officers, that its use was made available to every patient in the state. While its administration was, as far as possible, limited to patients in the preparalytic stage, it was used, as must

showed muscular weakness, a result that would be classed as "good" in the usual classification of the degrees of paralysis, and 76.9 per cent completely recovered.

Human convalescent serum was extensively used in the preparalytic group, so extensively that only 73 patients not given serum could be found in the series of 1,559 cases, and of these the condition as to recovery could not be ascertained in 28. The results in each instance are more favorable in the part of the group treated with serum, but the number of cases not so treated is too small to be of value for control purposes.

TABLE 3.—*Results Following Different Methods of Use of Human Immune Serum in Cases of Preparalytic Stage*

	Number of Cases	Deaths	Paralysis	Weakness	Complete Number	Recovery, per Cent of Cases
Intraspinally, alone or in combination	214	8	28	13	165	77
Intramuscularly, alone or in combination	203	6	34	15	148	73
Intravenously, alone or in combination	152	8	17	5	122	80
Intramuscularly, alone	76	2	13	5	56	74
Intravenously, alone	119	4	4	9	102	86

Table 3 gives the results for 435 patients who received human convalescent serum during the preparalytic stage. These results are classified with reference to the method of administration. It will be noted that the administration by the intravenous method, either alone or in combination with other methods, gives a slightly higher percentage of complete recovery.

Table 4 shows the results in 705 cases in which lumbar punctures and cell counts were made in the pre-

paralytic stage. Counts under 50 cells per cubic millimeter appear to indicate a more favorable prognosis, both as to fatality and to recovery without loss of function.

TABLE 4.—*Cases in Preparalytic Stage in Which Information Is Available by Number of Cells and Subsequent Outcome*

Cell Count per Cubic Millimeter	Number of Cases	Deaths		Paralysis			Complete Recovery	
		Number	Per Cent of Cases	Number	Per Cent of Cases	Weakness	Number	Per Cent of Cases
Under 50 cells.....	287	4	1.4	24	8.4	26	233	81
50 to 99 cells.....	149	8	5.4	31	20.8	14	96	64
100 to 199 cells.....	137	11	8.0	15	10.9	16	95	69
200 cells and over.....	119	9	7.6	21	17.6	16	73	61
No count or no cells..	14	0	...	0	....	1	13	..
Total.....	706	32		91		73	510	
Under 10 cells (included with "under 50" above).....	55	0		1		5	49	89

CONCLUSIONS

1. There was nothing unusual in the 1931 outbreak of poliomyelitis in upstate New York in its seasonal incidence or its geographic distribution. As in 1916, the outbreak upstate followed closely on the increased incidence in the city of New York.

2. Our experience indicates the feasibility of making a diagnosis in a large proportion of the cases in the preparalytic stage, utilizing laboratory methods, and of using convalescent serum even in rural areas.

3. In 1931 a fatality rate was recorded that was lower than that for any previous outbreak in upstate New York.

4. In our effort to determine the value of convalescent serum, it has not been possible to divide our cases into comparable groups and to form a conclusive judgment.

ABSTRACT OF DISCUSSION

ON PAPERS OF DRS. GORDON, KRAMER, PARK AND LAIDLAW

DR. W. LLOYD AYCOCK, Boston: There is a simple test by which, within reasonable limits, the dissemination of the diphtheria bacillus through a population can actually be traced. Just recently, Morales in Porto Rico has added what I think is the capstone to the epidemiology of diphtheria, in following a group of Schick positive individuals by throat cultures until they became Schick negative. He found that Schick positive individuals practically never became immune to diphtheria until after they had been shown to harbor virulent diphtheria bacilli. The tests for immunity on individuals following exposure to poliomyelitis reported by Dr. Kramer constitute the nearest approach we have, in the case of poliomyelitis, to such a study as Morales' in diphtheria. It is not always easy to implant the virus from the human spinal cord into monkeys, and is even more difficult to obtain the virus from washings from the nasal mucous membrane. In view of the difficulties in detecting the virus in nasal secretions and the relatively small number of attempts that have been made to carry out this expensive test, it would seem that the number of positive observations already recorded might well be indicative of a carrier rate in poliomyelitis equal to that of diphtheria. Preparalytic poliomyelitis can be recognized, I believe, with at least an average degree of clinical certainty. The statement is often made that preparalytic poliomyelitis cannot be diagnosed "unless one is looking for it," a statement that might apply to any disease. But in spite of the fact that this disease can be diagnosed with average clinical certainty, none of the signs, physical observations or symptoms in this early stage of the disease give any indication of what the ultimate outcome is to be. I agree with Dr. Park in the conclusion that although there is no statistical evidence that convalescent serum is effective, there is likewise no proof that convalescent serum has no effect. So I feel, from the point of view of the patient, that it still cannot be said that immune serum should not be given, but from the point of view of settling the question, convalescent serum should, where possible or necessary, be given to alternate patients with the disease in the hope that finally a definite verdict may be reached. I realize that an inconclusive report of this sort may be received with impatience, but all will have to agree that at present a progress report on the use of immune serum is inconclusive.

DR. EDWARD B. SHAW, San Francisco: I should like to ask Dr. Gordon, with regard to spinal fluid cell counts, whether he has ever done repeated counts in cases which initially showed a polymorphonuclear increase to see if there was a change during the later stages to lymphocytic predominance. I have never seen such a change actually demonstrated, although it is commonly assumed to occur. My conviction has always been that the type of cells is individual and fairly constant with a given case and that polymorphonuclear increase was evidence of marked meningeal reaction rather than that there was any correspondence between the type of cell and the stage of the disease. With regard to convalescent serum therapy of the disease, the point has been well taken by both Drs. Aycock and Park that the effectiveness of this type of treatment rather than the precise method of its application is the real point at issue. Laboratory experiments suggest, but fall far short of proving, the effectiveness of such treatment. In this connection I might mention that a recent laboratory experiment (unpublished) in a small series of monkeys indicated better results with those which were treated intramuscularly with convalescent serum than those which were untreated or were treated by some other route of administration. This evidence may very well not be borne out on a larger series but at least supports the use of serum by a route that is at the same time the simplest and the safest method of administration. The experience with convalescent serum in other virus diseases is, of course, not applicable to poliomyelitis; in connection with Dr. Aycock's mention of the use of convalescent serum in smallpox, however, it might be pointed out that British observers have recently reported strikingly better results in the treatment of postvaccinal encephalitis, in which the mortality in untreated cases was nearly 50 per cent, with convalescent serum procured from patients recently vaccinated. The study of end-results in treated and in untreated cases of an epidemic in which patients were treated by many different observers introduces so many variables with regard to the criteria used by various clinicians for diagnosis, prognosis and the determination of end-results that such statistics are practically valueless to the solution of the problem. The study of a controlled clinical experiment is possible only in the hands of a trained team, who must follow each case from start to finish. Even under these circumstances it is nearly impossible to control all the variables involved. Simply administering a single dose of serum from a convalescent does not necessarily constitute a fair test of treatment. That the serum was actually potent must be controlled either by monkey protection tests or by the use of successive doses obtained from different sources. There may be a great deal of variation between two serums each of which is capable of protecting monkeys from infection. A single injection of potent serum is, furthermore, not necessarily an adequate test of treatment, since there are few diseases in which, like diphtheria, the injection of a single dose of a therapeutic agent is curative. Repeated injections at short intervals may well be a preferable method of control. There may be a place in the study of this problem for the clinical opinions of those who watch cases of poliomyelitis from beginning to end and such an opinion may be just as valid as the arithmetical results of a controlled experiment. In the end, just such a clinical impression may be the most acceptable answer to the question of the utility or inutility of serum.

DR. LEWIS J. POLLOCK, Chicago: It is surprising to find the literature almost barren of any good clinical studies that can give one any indication as to the morbidity or mortality in poliomyelitis with respiratory paralysis. There is no way of determining the cases for which a respirator is indicated, as contrasted with cases in which recovery might occur and some of the complications of respiratory treatment be prevented.

This is even more true of paralysis. The experimental proof of what should be done with a paralyzed muscle resulting from a lesion of the lower motor neuron consists of a very few, exceedingly poorly performed and practically uncontrolled experiments on lower forms of animals. A muscle that is completely paralyzed may be rapidly recoverable, whereas a muscle in which only a few fibers may be paralyzed, and the whole muscle group therefore be weak, may be quite irreparable, and the recoverability of this muscle is dependent on the pathologic changes in the anterior horn cells. I believe there should be more extended studies correlating pathologic changes in the spinal cord of experimental animals suffering from poliomyelitis with various types of treatment of muscles during the paralyzed stage. The clinical reports as to what should be done with the muscle that is paralyzed as the result of a lesion in the anterior horn cell or in the peripheral nerve vary to such a degree that it is almost ridiculous. Some advise immediate electrotherapy, even with the appearance of the first rise in temperature; others, complete immobilization to last as long as two years. Somewhere between these two lies the truth. Unless some experimental data can be correlated with the results, we shall be no further along in ten years than we were during the epidemic of 1916. In a case of a complete Bell's palsy, with a completely paralyzed face on one side, when reaction to degeneration is incomplete one knows that the muscle will recover within three months, and it doesn't make a bit of difference as to how it is treated. I believe that more extended studies should be made by different methods, to determine the recoverability of a muscle suffering from a lesion in the lower motor neuron. Until it can be determined that a muscle is spontaneously recoverable, so that we know it will recover whether it is treated or not, we shall be unable to say whether treatment is efficacious.

DR. J. P. LEAKE, Washington, D. C.: The question of the use of convalescent serum in smallpox has been mentioned. The suggestion was made by Sternberg many years ago to use such convalescent serum, and particularly the serum of heavily vaccinated calves. It has been tried several times with not very flattering results, according to my interpretation; the last time I myself am aware of, during the Kansas City epidemic of 1921, although I think something was done in Detroit also. Neither the experience in England nor that in Holland has been at all convincing to me as to the usefulness of so-called convalescent serum in cases of encephalomyelitis following vaccination.

DR. A. C. SILVERMAN, Syracuse, N. Y.: If our present concept of the epidemiology and immunology of the disease is right, Dr. Kramer's report should teach us that it isn't correct to assume that any indefinite illness in a young child during a poliomyelitis outbreak is to be looked on as a probable abortive case of poliomyelitis. I think it is something that clinicians need to guard themselves against, because there is still too great a tendency to call everything poliomyelitis during an epidemic. If it can be shown, as he has done, that patients who have had indefinite symptoms during an outbreak have not developed immune bodies in their blood, the tendency to make much of so-called abortive cases will be overcome. Another question is whether poliomyelitis should be looked on as the beginning of a systemic infection which later invades the nervous system. It seems to me that it is not definitely established at all that the disease is primarily systemic. After all, it may be considered as a primary infection of the nervous system.

DR. S. D. KRAMER, Boston: I should like to discuss one question raised by Dr. Shaw. Of course the neutralization test has been of great value and I think that when properly controlled it can be very useful in giving certain information. I must, however, take exception to any claims that the test has reached the point of refinement and delicacy which would permit one to carry on accurate titrations of any general significance. Convalescent serum titrated by Dr. Shaw might yield far different results from titrations carried on at another laboratory. There is no standard serum or standard virus to permit titrations for such general application. In testing the serum for neutralizing substances, all that one can hope to say is that such serum contains sufficient of such immunizing substance to neutralize an amount of virus which may equal from 500 to 1,000 infecting doses. I might assure Dr. Shaw that all the serums used in Brooklyn and Hartford were tested for neutralizing substance with that in mind.

DR. HAROLD L. AMOSS, Durham, N. C.: I should like to believe that poliomyelitis is a systemic disease, but I do not believe that there is sufficient evidence to support such a conclusion, because those signs which reflect the possibility of systemic disease occur likewise in tuberculous granuloma of the central nervous system. Such symptoms may arise from infection confined to the central nervous system. In order to determine whether or not convalescent serum has any value, Dr. George Berry and I followed the cases that occurred in Baltimore about three years ago. Dr. Berry followed for two years the patients who were treated in the preparalytic stage but who came to paralysis. No one can doubt that these patients had poliomyelitis, because they showed the complication of the disease; viz., paralysis. Dr. Berry collected the statistics which were furnished him by purely objective observers, orthopedic surgeons who did not know whether the particular patient had received serum or not. He thinks that in this series the rate of recovery in the patients treated after paralysis had appeared is greater than in the control cases in which serum was not given, and further that, in cases in which the patients were treated in the preparalytic state but came to paralysis, the rate of recovery was far more rapid. The ultimate results in the last group were astonishingly superior. I am presenting this, not as evidence that serum is of any value, but to indicate a more precise method of analysis.

DR. J. E. GORDON, Detroit: The presence of very many neutrophilic leukocytes is an uncommon observation in the cerebrospinal fluid of patients in the preparalytic period of poliomyelitis. Lymphocytes usually predominate and only in the exceptional instance of very early diagnosis do the polymorphonuclear cells outnumber other forms. I have not observed cases in which neutrophils predominated throughout the course of the disease.

DR. WILLIAM H. PARK, New York: As to Dr. Shaw's statement about the convalescent serum, I think the way it was used in New York was really a suitable one to determine its value, because each lot of the serum was obtained from the pooled blood gathered from ten or twelve persons who had previously recovered from poliomyelitis. Every lot of serum was tested in monkeys for its potency and was used only when it had considerable potency. So, throughout the season, different lots of serum became available and were used, but at all times new children were being added to our list, both of the treated and the untreated cases. The severity of the epidemic varied but slightly during the different months of the summer and fall. Our cases were in almost every instance carefully examined at the end of three or four weeks and again at the end of several months. While the amount of paralysis in each case was not gone into with the minute detail which Aycock and Kramer gave to their cases, nevertheless I believe that our results are as accurate. No appreciable difference was noted in the improvement of the treated as contrasted with the untreated patients. The experience of last summer indicates, therefore, that when the virus of poliomyelitis has produced changes in the central nervous system sufficient to cause symptoms which are adequate to make a diagnosis, it is already too late to expect a curative effect from the injection of convalescent serum.

DR. FRANK W. LAIDLAW, Middletown, N. Y.: I am convinced that no conclusive opinion can be formed of the value of convalescent serum from the data collected in the upstate New York cases. The only valuable method would be that of alternate cases. I think, however, that the state of New York has demonstrated the practicability of utilizing laboratory methods in diagnosis in rural sections.

Advance in Syphilology.—The Treponema pallidum was discovered by Max Schaudinn in 1905, the Wassermann reaction followed in 1906, in 1910 Ehrlich introduced the salvarsan treatment, and in 1917 Wagner von Jauregg of Vienna originated the treatment of general paralysis of the insane by induced malaria. Rolleston, Sir Humphry: The Changes in the Medical Profession and Advances in Medicine During the Last Fifty Years, *Brit. M. J.* **2**:132 (July 23) 1932.

ACUTE ANTERIOR POLIOMYELITIS IN THE CHICAGO AREA IN 1931

SYMPTOMATOLOGY, CLINICAL OBSERVATIONS AND CONVALESCENT SERUM THERAPY

SIDNEY O. LEVINSON, M.D.
CLARICE McDOUGALL, B.S.
AND
WILLIAM THALHIMER, M.D.
CHICAGO

Acute anterior poliomyelitis occurs endemically in Illinois and with greatest frequency in the late summer months. Because of the favorable reports of the results from convalescent serum therapy, the Samuel Deutsch Convalescent Serum Center [1] was founded in Chicago, with the primary purpose of supplying convalescent serum for patients suffering from anterior poliomyelitis in the preparalytic or early paralytic stages. Blood for serum preparation was collected in the usual manner,[2] pools of from 2 to 3 liters being prepared from 15 to 40 samples of blood.[3]

Because of the limited supply of convalescent serum, an attempt was made to supervise its distribution through physicians on the staff of the serum center. Cases of poliomyelitis, or suspect poliomyelitis, were reported to the serum center by the private physician or the city health department. The staff physician, equipped with the necessary materials for performing a spinal puncture and fluid examination in the home, saw the suspect case with the family physician, and, when indicated, serum was administered. As these patients were immediately hospitalized, their subsequent course and progress could be followed with relative ease.

There were many cases outside the city referred to us by the Illinois State Department of Health because of their greater proximity to Chicago, and these cases were supplied with serum from this center. It was not possible to reach these cases through the staff physicians, but complete records and reports were made by the local attending physicians.

Serum therapy has seemed of benefit if employed in the preparalytic stage, as indicated in reports by Draper,[4] Zingher,[5] Amoss and Chesney,[6] Aycock and Luther,[2] Ayer,[7] Aycock, Luther, McKhann, Smith and Kramer,[8] Shaw, Thelander and Fleischner [9] and many others. We were unable to limit the use of serum to purely preparalytic cases for obvious reasons, but used it also in early paralytic and even advanced cases that were still in the active phase of the disease. Because of the limited supply of convalescent serum, several pools of normal serum were collected for use in the paralytic cases. Zingher [5] had reported on the use of normal adult human serum in 1917 with good results. Aycock and Kramer [10] have definitely demonstrated that a large percentage of normal urban adults giving no history of poliomyelitis have virus neutralizing substances in their blood, and Shaughnessy, Harmon and Gordon [11] found by neutralization tests that the serums of many adults, who apparently had escaped poliomyelitis, possessed as potent protective properties as the serums of recovered poliomyelitis patients. It was relatively easy to collect large pools of normal adult serum, and these, as well as pooled lots of convalescent serum, were tested on monkeys (Macacus rhesus) in the laboratories of Dr. N. Paul Hudson of the University of Chicago, the results of these tests appearing in connection with another phase of the subject.[12] Thus there were two supplies of serum available, both of proved virus neutralizing potency: the convalescent serum for preparalytic cases and the serum from normal adults for paralytic cases.

The method of treatment followed in all but one of the city cases was combined intraspinal and intravenous serum administration. There has been much discussion as to the best route for serum administration, and there has arisen the theoretical objection to intrathecal administration that the serum irritates the meninges, diminishing meningeal resistance and disrupting the integrity of the meningochoroidal barrier.[13] It should be realized, however, that even in the preparalytic stage of poliomyelitis the meninges and choroid plexus have already been invaded, and an inflammatory reaction has occurred as reflected in the altered spinal fluid. This knowledge, combined with the fact that meningeal irritation also promotes the passage of neutralizing substances from the blood into the spinal fluid,[14] led us to believe that no serious consequences would follow intrathecal serum administration. Most of the patients outside of the center's reach received similar treatment, but some of the patients did not receive intraspinal therapy. These cases are too few, however, to enable any justifiable comparison as to the relative merits of the different routes of administering the serum.

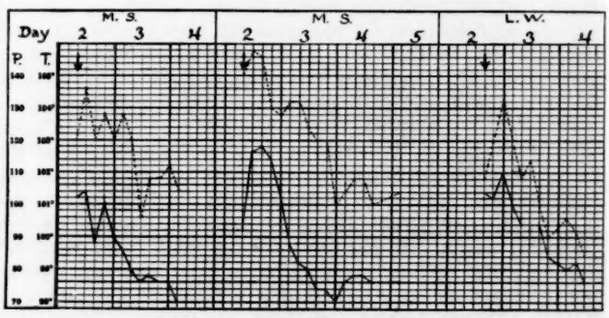

Chart 1.—Temperature (solid line) and pulse (broken line) in three patients. Arrows denote administration of serum.

All patients selected for this report, when first seen, received both an intraspinal dose of from 10 to 20 cc. of serum and an intravenous dose of from 40 to 60 cc. of serum. The amount administered intraspinally depended on the age of the patient and the amount of spinal fluid withdrawn. At least 5 cc. more spinal fluid was removed than the amount of serum injected.

From the Samuel Deutsch Convalescent Serum Center of Michael Reese Hospital.

1. This serum center was established through the generosity of the children of Mr. Samuel Deutsch.
2. Aycock, W. L., and Luther, E. H.: Preparalytic Poliomyelitis, J. A. M. A. **91:** 387 (Aug. 11) 1928.
3. We are indebted to many agencies for their cooperation and aid in the collection of serum; in particular, Dr. Herman N. Bundesen, president of the board of health of Chicago; Drs. Andy Hall and H. J. Shaughnessy of the Illinois State Department of Health and the Winnetka Department of Health, respectively; Miss Edna Foley of the Visiting Nurse Association of Chicago; the Visiting Nurse Association of Evanston, and many physicians who aided in securing the donation of blood from their own patients.
4. Draper, George: Acute Poliomyelitis, monograph, 1917.
5. Zingher, Abraham: The Diagnosis and Serum Treatment of Anterior Poliomyelitis, J. A. M. A. **68:** 817 (March 17) 1917.
6. Amoss, H. L., and Chesney, A. M.: J. Exper. Med. **25:** 581 (April) 1917.
7. Ayer, W. D.: Am. J. M. Sc. **177:** 540 (April) 1929.
8. Aycock, W. L.; Luther, E. H.; McKhann, C. F.; Smith, E. C., and Kramer, S. D.: J. Infect. Dis. **45:** 175 (Sept.) 1929.
9. Shaw, E. B.; Thelander, H. E., and Fleischner, E. C.: Convalescent Serum in Preparalytic Cases of Poliomyelitis, J. A. M. A. **85:** 1555 (Nov. 14) 1925.
10. Aycock, W. L., and Kramer, S. D.: J. Prev. Med. **4:** 189, 201 (May) 1930.
11. Shaughnessy, H. J.; Harmon, P. H., and Gordon, F. B.: J. Prev. Med. **4:** 463 (Nov.) 1930.
12. Hudson, N. P., and Lennette, E. H.: J. Prev. Med. **6:** 335 (July) 1932.
13. Flexner, Simon, and Amoss, H. L.: J. Exper. Med. **20:** 249, 1914.
14. Flexner, Simon, and Amoss, H. L.: J. Exper. Med. **25:** 525 (April) 1917.

Occasionally, in a very young infant, intravenous administration proving too difficult, serum was given intramuscularly. In this way every infant received at least 60 cc., and every child at least 80 cc. of serum. Because there is no standardization of the serum nor any method for determining the optimum dosage, we felt that large doses of serum should be given at the initial injection. Because of the limited supply we fixed the amount for administration at 60 cc. for infants and 80 cc. for children and adults, with the hope that we might increase this dose when our supply of serum became more abundant.

Most patients were seen twenty-four hours later and examined carefully for evidence of continuation of the disease. Continued elevation of temperature and rapid pulse, no improvement in the general condition, and evidence of progression of the disease process were the criteria for the further administration of serum. These injections were given intravenously to all patients except those who displayed a marked advance of the disease, and for these patients the combined administration of the serum was again employed.

We furnished serum for 183 patients during the past year. A number of the reports received from physicians contained insufficient data to prove that the case was one of anterior poliomyelitis. Also, in a number of these cases, whereas the first examination indicated that the diagnosis of poliomyelitis was very probable and serum was administered, the subsequent examinations and the progress of the disease showed that the patient was suffering from some other condition, such as tuberculous meningitis or encephalitis.

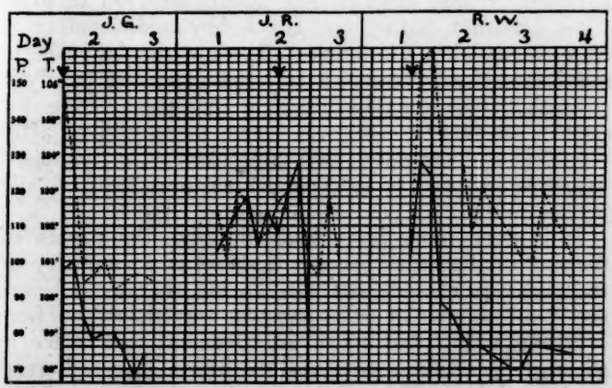

Chart 2.—Temperature (solid line) and pulse (broken line) in three patients. Arrows denote administration of serum.

Therefore, since we could not feel certain that some of these individuals were suffering from poliomyelitis, these cases are not included in this report. Every case in which the diagnosis was established is included. This critical analysis leaves 130 cases in which careful examination of the patient and the spinal fluid, and the clinical course fulfilled all the accepted criteria necessary for a diagnosis of poliomyelitis. Serum was administered both intraspinally and intravenously, and the course of the illness was followed into the convalescent stage.

Seventy-three cases were seen and followed by the physicians of the serum center, and the remaining fifty-seven were seen by other physicians, who administered serum and were very cooperative in giving a full report of their cases. We have designated those cases observed by the center physicians as "inside" cases, the others as "outside" cases. Of the 130 cases, there were 65 diagnosed and treated in the preparalytic stage; in the remaining 65, some degree of paralysis had already developed before serum was employed. The

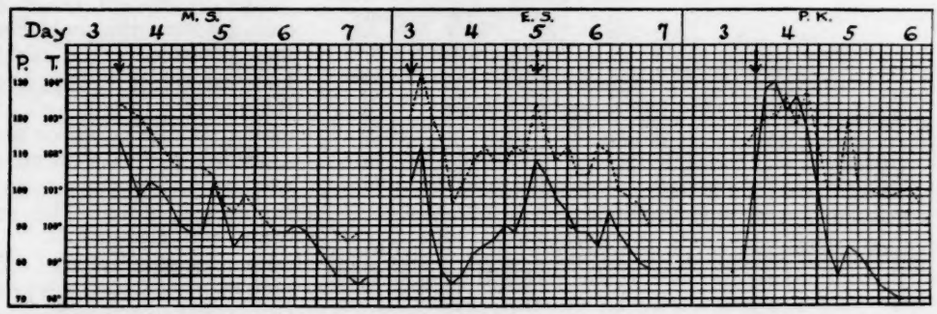

Chart 3.—Temperature (solid line) and pulse (broken line) in three patients. The solid arrows denote adminis ration of serum and the dotted arrow a suppurating chalazion.

latter cases were subdivided into two groups, "early paralytic cases," those treated within thirty-six hours of onset of paralysis, and "late paralytic cases," those treated after thirty-six hours of paralysis. There were 112 cases in infants and children, 69 in boys and 43 in girls. Eighteen cases occurred in adults, nine in each sex. The youngest patient was a girl, aged 8 months; the oldest a man, aged 45.

SYMPTOMATOLOGY AND CLINICAL OBSERVATIONS

In general, the symptomatology of the disease corresponded with that described in other reports. About one third of the cases were of the dromedary type. As will be seen in table 1, the most frequent complaint was headache; nausea or vomiting also occurred with great frequency. A history of sore throat was relatively common, occurring in about 40 per cent. Diarrhea was uncommon, as was frequency of urination. At times there was a marked retention of urine, but this never required catheterization. There was pain of the back, the back of the neck or the extremities in over half the cases. An increased temperature was always present, usually between 101 and 102 F., the pulse rate averaged 120. A generalized lymphadenopathy was found only a few times; more often there was only a cervical lymphadenopathy, usually associated with a reddened throat. Although the "spine sign" was a frequent and very suggestive finding, it was elicited less often than cervical rigidity. Particularly is this true in bulbar poliencephalitis. Another sign that was found in over 50 per cent of the cases seen in the city is the "head drop." This sign is best elicited by placing both hands under the shoulder blades and raising the patient to a sitting posture. The head falls backward and cannot be brought to an erect position by the patient's efforts. We have considered this additional sign of value, for it may be present when cervical or back resistance is so slight as to be doubtful. The histories of the most severe onsets of gastro-intestinal upsets and headache have more frequently been associated with the bulbar than with the spinal type of the disease. However, it is not of sufficient constancy to enable one to draw any prognostic conclusions. A tremor has been observed in over 50 per cent of the cases but has

been varied in character. It appears in the preparalytic stage, as a fine or coarse tremor of the extremities, less commonly as an ataxic tremor, and occasionally, in very toxic cases, as a diffuse "shivery" tremor of the body. Perioral pallor was often present. Muscle tenderness was far more frequent than hyperesthesia. Brudzinski and Kernig signs were variable, found in less than one

TABLE 1.—*Relative Occurrence of More Common Symptoms and Conditions*

	Inside	Outside	Total	Percentage
Number of cases	73	57	130	100
Nausea, vomiting	35	39	74	51
Constipation	28	25	53	41
Headache	46	50	96	74
Injected throat	25	17	42	32
Rigid back	44	41	81	62
Rigid neck	58	54	114	88
Tremor	33	30	63	47
Head drop	39	..	39	53
Prostration				
Mild	33	31	64 }	51
Severe	10	1	11 }	

fourth of the cases. It is important to realize that many of the symptoms, and most of the physical or neurologic signs, may not necessarily be present. Many of our cases did not confirm the finding of a prostration greater than expected with the moderate fever. Of the seventy-three "inside" cases, thirty-three showed moderate prostration and ten a severe degree of prostration out of proportion to the hyperpyrexia; thirty cases presented no evidence of any severe illness, and the patients seemed no sicker than could be expected with an infection of the upper respiratory tract. Several patients were free of any neurologic manifestations that could lead one to make a diagnosis of poliomyelitis. Because of the general symptoms, a history of exposure and the season of the year, we felt that the additional information which could be obtained by lumbar puncture was essential, and only on the positive spinal fluid results was the physician able to make a diagnosis.

TABLE 2.—*Comparison of Mortality of Different Groups*

Group	Number of Patients	Number Died	Mortality, per Cent
Inside			
Preparalytic	32	1	3
Early treated paralytic	21	2	10
Late treated paralytic	20	5	25
Untreated paralytic	108	22	20
Outside			
Preparalytic	33	2*	6
Early treated paralytic	15	5	33⅓
Late treated paralytic	9	3	33⅓

* One patient died of bronchopneumonia two days after poliomyelitis.

TABLE 3.—*Preparalytic Patients*

	Inside	Outside	Total	Percentage
Number of patients	32	33	65	100
No paralysis	16	15	31	49
Temporary paralysis	12	8	20	30
Permanent paralysis, mild	1	7	8	12
Permanent paralysis, moderate	2	1	3	4.5
Permanent paralysis, severe	0	0	0	0
Died	1	2*	3	4.5

* One patient died of bronchopneumonia superimposed on acute poliomyelitis.

Meals and Bower [15] have been impressed by this absence of neurologic manifestations and reported that 22 per cent of their patients had no abnormal neurologic signs at the time of their first examination but had characteristic spinal fluids.

The spinal fluid pressure, as determined by the drop method, was normal or moderately increased. The usual count was from 50 to 250 cells, the lowest being 4, the highest 740. In all but a few cases there was a predominance of mononuclear cells in the fluid; when polymorphonuclear leukocytes were more numerous, the case was usually very early. In all cases globulin was increased, determined by the Ross-Jones ring test, saturated ammonium sulphate being used. At times, the ring was slow in forming but invariably became quite distinct within fifteen minutes.

A comparison of the relative mortalities of the various groups and also of untreated cases reported by the health department (table 2) discloses a marked difference between the mortality of the preparalytic and of the untreated or the paralytic group. The total mortality of the preparalytic group is 4.5 per cent, and if the one case in which death was due to a bronchopneumonia superimposed on a poliomyelitis is discarded the mortality rate is reduced to 3 per cent. Realizing the weakness of any statement that compares a preparalytic group with a paralytic group, we do not attempt to draw any conclusions. It is necessary, however, to point out that of the total of sixty-five preparalytic patients there were thirty-four (table 3) who developed temporary or permanent weakness, and on the basis of

TABLE 4.—*Results of Paralytic Cases Treated*

	Inside		Outside		Total	
	Early Paralytic Group	Late Paralytic Group	Early Paralytic Group	Late Paralytic Group	Early Paralytic Group	Late Paralytic Group
Number of patients	21	20	15	9	36	29
Improved	7	7	6	2	13	9
Same	7	8	4	4	11	12
Progressed	7	5	5	3	12	8
Died	2	5	5	3	7	8

thirty-four cases, the mortality would be only 9 per cent, less than half the figure (20 per cent) for the untreated cases.

PARALYTIC GROUP

No inferences can be made from the statistics of the paralytic treated group. The groups are too small to allow accurate deductions, for a few additional cases may greatly alter the figures. It must also be borne in mind that this group is a selected group of paralytic cases that were much more severe than the average, for only in the gravest cases was serum therapy given after paralysis had appeared, and consequently an increased mortality rate was to be expected and necessarily should be discounted.

It is even more hazardous to judge the merits of therapy in the latter group. Table 4 is a summary of the progress of such cases following therapy. Again, the small number of cases must be emphasized. There is a suggestion that more improvement took place in the early paralytic group, and the mortality rate is relatively smaller. There is no means of comparing the results obtained in these cases with the data from a similar untreated group, and even such comparison would be fallacious unless each series was very large. In many of our cases there seemed to be a prompt clinical improvement, but such response cannot be attributed entirely to serum, for many cases under no treatment show a critical change at varying intervals after the onset of paralysis.

Although we endeavor to limit the use of the convalescent serum to preparalytic cases, we found that thirty-two patients had received convalescent and thirty-three had received normal serum after the development of paralysis. A comparison of the results obtained from

15. Meals, R. W., and Bower, A. G.: J. Lab. & Clin. Med. **17**: 409 (Feb.) 1932.

the use of the two different serums reveals no obvious difference in their effects (table 5). Those patients receiving the convalescent serum did not fare better to any appreciable degree than did those who were treated with the normal serum. This result, in a clinical way, seems to correspond to the experimental observation that pooled normal adult serum is as effective in neutralization tests as is convalescent serum.[16]

TABLE 5.—*Results of Treating Paralytic Poliomyelitis with Convalescent as Compared with Normal Serum*

	Inside		Outside		Total	
	Convalescent Serum	Normal Serum	Convalescent Serum	Normal Serum	Convalescent Serum	Normal Serum
Number of patients	17	24	15	9	32	33
Improved	7	7	5	4	12	11
Same	4	12	5	2	9	14
Progressed	6	5	5	3	11	8
Died	2	5	5	3	7	8
Mortality, per cent	12	21	33	33	22	24

PREPARALYTIC GROUP

A more critical analysis of the preparalytic cases studied is to be found in tables 3 and 6. As can be seen, of the group of sixty-five, thirty-one showed no muscle involvement at any time, while twenty developed temporary palsies that cleared during the three week period of isolation. Eight were left with very mild weakness of one or two muscle groups that was detectable only by careful examination, and three had paralyses that were more obvious, involving several muscle groups. In no instance was the muscle power poor, for even in the worst case there was good active motion of the involved muscles, although no motion against resistance. Two patients developed bulbar symptoms and died, while a third, who seemed to react very favorably to convalescent serum with a temperature drop and clinical improvement in twenty-four hours, subsequently developed a confluent bronchopneumonia and died. Table 6 subdivides the preparalytic cases

TABLE 6.—*Results of Preparalytic Cases Treated, in Relation to Time Interval After Onset of Meningeal Symptoms*

Hours After Onset of Meningeal Symptoms		Number of Patients	No Paralysis		Temporary Paralysis		Permanent Paralysis, Mild		Permanent Paralysis, Moderate		Died	
			No.	%	No.	%	No.	%	No.	%	No.	%
0-12	Inside	9	6	66	3	33	0	0	0	0	0	0
	Outside	0	0	0	0	0	0	0	0	0	0	0
12-24	Inside	7	4	57	1	14	1	14	1	14	0	0
	Outside	21	12	57	4	19	3	14	1	5	1	5
24-48	Inside	10	2	20	7	70	0	0	0	0	1	10
	Outside	9	3	33	4	44	1	11	0	0	1	11
48-72	Inside	2	2	100	0	0	0	0	0	0	0	0
	Outside	3	0	0	0	0	3	100	0	0	0	0
72+	Inside	4	2	50	1	25	0	0	1	25	0	0
	Outside	0	0	0	0	0	0	0	0	0	0	0

according to the time period elapsing between onset of meningeal symptoms and administration of convalescent serum.

The two series of "inside" and "outside" cases disclose roughly parallel results. A study of the charts reveals the fact that, in general, the earlier the case was treated, the more satisfactory was the result obtained. The greatest percentage of those showing no paresis occurred in those cases treated within twenty-four hours after onset of meningeal symptoms. There were four cases treated more than seventy-two hours after onset of symptoms. Although it was felt that these would prove to be nonparalytic preparalytic cases, serum therapy was administered because of the presence of elevated temperature and evidence that the acute infection had not completely subsided. Two of the four patients recovered without any involvement, and it is debatable whether the serum was any factor in their recovery. One developed a temporary paralysis, the fourth a moderate paresis of the right deltoid, triceps, biceps and left anterior tibial, these muscles showing fair strength and steady improvement.

BULBAR GROUP

In this series of cases studied, there was a total of twenty-eight that was of a bulbar or encephalobulbar type. These were the cases that showed greatest toxicity in the early stage. They had a much shorter prodromal history, in some not more than twenty-four hours, and the illness was accompanied by severe prostration. The cell count of the spinal fluid in most cases was around 50; there was only one that reached 250. These cases were all treated with serum in the usual way. The results are outlined in table 7. Three cases seemed to show a striking clinical improvement following therapy. In these cases, the temperature rapidly dropped to normal, the toxicity cleared, and the

TABLE 7.—*Results in Encephalobulbar Patients Receiving Serum*

Serum Therapy Hours After Onset of Paralysis	Inside			Outside		
	Recovered	Died	Mortality, per Cent	Recovered	Died	Mortality, per Cent
0 (preparalytic)	1	1	50	..	1	100
24	6	2	25	2	4	67
48	2	3	60	1	3	75
72	1	1	50	..	..	..
Total	10	7	41	3	8	73

patient entered the convalescent stage. However, other cases showed no distinct benefit from serum but continued to progress steadily to a fatal outcome or gradual recovery, so that not only did we doubt the value of the serum, but we feared that the intraspinal administration might not be innocuous, in that it might increase pressure on a medulla already inflamed and edematous and unable to tolerate any additional strain.

It is well recognized that the course of bulbar poliomyelitis is rapid and frequently fatal. Since the mortality was no greater in these serum treated cases than was to be expected if no therapy had been employed, we are unable to ascribe any definite ill effect resulting from the serum. We feel that each case must be individualized, for some of these patients are so desperately ill that intrathecal serum therapy, with the necessary lumbar puncture, may do more harm than good, and in such cases the serum should be administered only intravenously.

In all other cases there was in no instance any serious effect that could be attributed to the serum. When administered intraspinally, it accentuated the neck and back rigidity in most cases. Subjectively, there was no increase in symptoms. In some, the increased rigidity lasted several days. In those cases in which repeated spinal puncture was done, we were surprised by the results. We had been led to believe that in every case there would be evidence of serum irritation of the meninges, with an increase of fluid, pressure and cell count, with a predominance of polymorphonuclear leukocytes. Contrary to our expectations, all but one case disclosed a marked diminution of fluid in the spinal canal, markedly decreased pressure, and very little change in the cell count. In table 8 are listed

16. Shaughnessy, Harmon and Gordon (footnote 11). Hudson and Lennette (footnote 12).

some of the cases in which the laboratory work was accurately checked. In only one was there a marked increase of fluid and cell count. There were other cases in which similar observations were made but, accurate cell counts not being available, they are not included.

There never occurred any reaction to the intravenous administration of the serum. We were assured that pooled serum is compatible with any blood group, for our tests demonstrated that it did not agglutinate a suspension of cells of a group IV (Jansky). We felt confident, therefore, that in injecting intravenously 40 or 60 cc. in children, no untoward reaction would occur. At times there was a twelve hour rise of 0.5 to 1.0 degree of temperature, but, without any associated conditions, this rise in temperature could hardly be attributed to the serum.

TABLE 8.—*Result of Serum Administration on Spinal Fluid*

		Preceding Serum				Following Serum Intraspinally				
Patient	Age	Date	Spinal Fluid Cell Count	Mononuclears, per Cent	Spinal Fluid Pressure	Date	Hours After Injection	Spinal Fluid Cell Count	Mononuclears, per Cent	Spinal Fluid Pressure
J. B.	9	7/20	46	80	Increased	7/20	18	124	80	Decreased
R. L.	10	8/15	60	50	Increased	8/17	36	70	90	Decreased
D. A.	7	8/25	38	92	Increased	8/27	36	1,500	..	Increased
J. A.	5	9/ 5	240	80	Increased	9/ 6	24	210	..	Decreased
H. D.	9	9/29	250	..	Increased	9/30	24	350	..	Normal
D. W.	19	11/20	46	55	Increased	11/22	48	26	100	Decreased

COMMENT

It is extremely difficult to draw any definite conclusions as to therapeutic efficacy of serum from our limited clinical study. The ideal course of running a control series and making periodic muscle examinations was not available to us. A study of this kind was recently made in the East in a limited number of cases.[17] But we do wish to point out that of the sixty-five patients treated in the preparalytic stage there were thirty-four who manifested some degree of paralysis, and the mortality in this subgroup was less than half the mortality in the untreated paralytic cases in the city. Furthermore, in none of these cases was the involvement severe, and the total paralysis of this group was almost minimal when compared with a like number made up of the untreated paralytic patients who had the least paralysis. We realize that there may have been many nonparalytic poliomyelitis cases with similarly good results. The validity of such an argument is lessened when it is realized that the physicians were definitely on the alert for cases of poliomyelitis and, whenever suspicious, they notified the Serum Center.

We feel that the clinical reaction to the serum should be stressed. There were many patients treated who showed such a prompt and favorable response within twenty-four hours, a temperature drop to normal and complete subsidence of symptoms and signs (except for some increased neck rigidity following spinal serum administration) that it seemed almost specific, as shown in the accompanying charts. This response was most striking when it occurred in individuals treated within twenty-four hours of onset of symptoms, cases that would ordinarily be expected to run several days before convalescence.

This clinical improvement, following shortly after serum therapy, seemed quite significant, even though it did not always occur.

Although unable to ascertain the precise value of convalescent serum, we feel justified, from the results obtained, in recommending the combined therapy of convalescent serum in preparalytic poliomyelitis at the earliest possible moment. Cases of encephalobulbar poliomyelitis must be individualized. The patients who are so severely prostrated that even the manipulation attending a lumbar puncture might be hazardous should receive serum only intravenously. The remainder may be treated by the combined method. The value of serum therapy in individuals already paralyzed is questionable and debatable. When a surplus of serum is at hand, it can be used for the problematic benefit in arresting an apparently extending paralysis. Since it is almost impossible to secure a surplus of convalescent serum, pooled serum from normal adults should be used, for the latter can be obtained with ease, and experimentally its use is as logical as is that of the convalescent serum. Until more rational and effective therapy is advanced, convalescent or normal adult serum treatment should be continued.

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INTESTINAL STASIS IN INFANTS AND CHILDREN

CHARLES G. KERLEY, M.D.
NEW YORK

A clinical serial roentgenographic study of 371 patients with persistent gastro-intestinal disorders supplies the material for this contribution. The term intestinal stasis is used in that it locates the disorder and designates its nature as one of dysfunction—a condition dependent on faulty intestinal mechanics.

It has been demonstrated that there exists in the infant and child a pronounced interdependence between the various divisions of the gastro-intestinal system; thus for normal stomach emptying there must be normal bowel elimination. My associates and I have demonstrated that stasis may occur in both the small and the large intestine. In the small intestine the stasis in our experience has been dependent in a vast majority of the cases on stasis in the colon. In but three of the patients was it due to a lesion elsewhere. In one there was tuberculous peritonitis proved by autopsy. In two there were intestinal bands, one relieved by operation; in the other the outcome was fatal.

Our cases of clinical and roentgenographically demonstrated stasis, with these exceptions, fall into three groups:

Group 1 is composed of those persons with elongated redundant, sacculated colon and sigmoid. Among this group we found the most troublesome type of habitual stasis, dysfunction, so-called chronic constipation. A subdivision of redundant colons according to position of the intestine is not applicable in the child. It is a matter of space—the narrow undeveloped pelvis, on the one hand, and the long intestine adjusting itself by

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reduplication on the other. Repeated injections of barium sulphate fail to show a repetition in the position of the redundant intestine. When it occurs the apparent fixation is looked on as possible evidence of adhesions—bands, congenital or acquired.

In group 2 are included the structurally normal persons in whom the stasis is dependent on muscle incoordination and is evidenced by circular fiber spasm without demonstrable lesion or anomaly. We have observed this phenomenon repeatedly in spasmophilic hypertonic infants and children in whom the constitutional inferiority, the nerve imbalance, is emphasized in the intestinal tract. This circular fiber spasm may involve large sections of the intestine or but a few circular fibers, producing the appearance as though a suture has been tied around the intestine. It has been shown that the circular fiber spasm may be of but a few seconds' duration or it may continue for days. The habitually spastic sphincter ani muscle we have learned by roentgenographic and clinical study may explain an

Fig. 1.—Dilated cecum and ascending colon; elongated transverse colon and elongated spastic descending colon and sigmoid.

habitual sigmoid and colonic stasis. The prompt response of this type to diet, and particularly to atropine therapy, offers conclusive evidence that the stasis in this group was not due to an anomaly or to a pathologic condition.

Group 3 includes those patients who present the symptoms of clinical stasis and roentgenographic findings identical with group 2 but in whom the phenomena appear to depend on a pathologic basis located in the abdominal cavity within or outside of the intestinal tract. In our cases we have found the imbalance associated with chronic appendicitis, chronic mucous colitis and mesenteric adenitis. The persistently spastic cecum, in the absence of a demonstrable diseased appendix, gives strong presumptive evidence of the presence of chronic appendicitis which cannot be visualized by the x-rays. Regardless of the cause of the stasis, there is an associated symptom complex similar in all. There is bowel dysfunction to the degree of requiring daily assistance for evacuations. Habitual intestinal stasis has explained gastric retention often associated with a traumatic mucous gastritis and habitual absence of appetite. We have demonstrated abdominal and stomach pain in many cases as the immediate result of a gas block dependent on muscle incoordination.

MANAGEMENT

The results of the treatment are strikingly satisfactory. The proved diseased appendix is removed and the muscle incoordination ceases. For the hypertonic

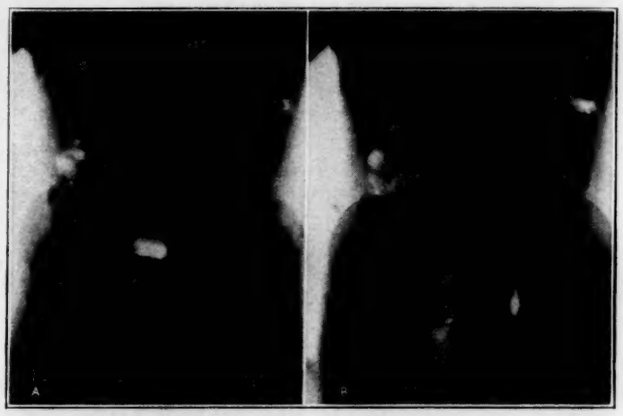

Fig. 2.—Spastic colon and sphincter ani spasm. *A* was taken forty-eight hours after a barium meal; *B*, seventy-two hours after.

infants with nerve imbalance, atropine is given in near physiologic doses with liquid petrolatum once daily, and the aromatic fluidextract of cascara sagrada in sufficient dosage three times a day to produce two evacuations in twenty-four hours. When the habit of daily evacuation is established the cascara sagrada is gradually discontinued. Atropine is added to the medication if the roentgenogram suggests muscle incoordination. A mixed diet is ordered with cereals, vegetables and fruits predominating. Fresh cow's milk is given in rather small quantities, acidophilus milk

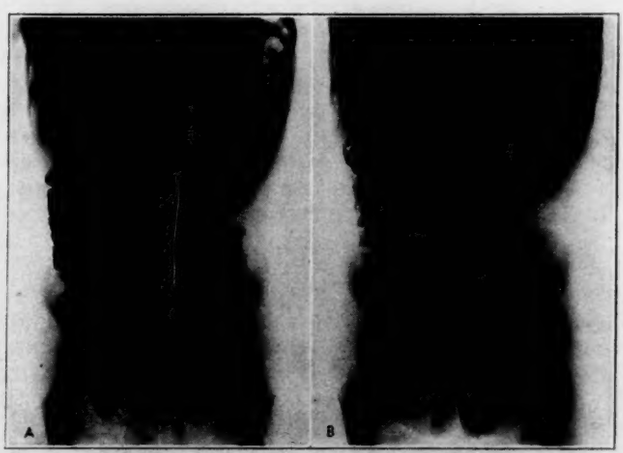

Fig. 3.—Spastic colon. *A* was taken twenty-four hours after a barium meal; *B*, seventy-four hours.

being substituted when it will be taken by the child. Three meals daily are permitted with a five hour interval. Milk between meals is to be avoided in all cases of stasis. In those in which anorexia is not a prominent symptom, raw fruit is advised for the mid-afternoon.

REPORT OF CASES

Group 1.—CASE 1.—A girl, aged 9 years, had never had a normal evacuation; medication or enemas were the daily habit. Figure 1 shows the dilated cecum and ascending colon—a

greatly elongated spastic colon. The child suffered from recurrent attacks of vomiting at intervals of from six to eight weeks associated with severe abdominal pain localized in the right lower quadrant, and appendicitis had been suspected. Entire relief was obtained by medication and diet with no return of the paroxysmal seizures and with complete relief for three years.

Group 2.—CASE 2.—A girl, aged 7 years, came to us because of obstinate constipation; she had never had a normal evacuation. Figure 2 shows a spastic colon. A barium meal was retained after forty-eight hours. Traces of the meal were seen in the transverse colon and sigmoid after seventy-two hours. There was marked malnutrition; the child was 14 pounds (6.4 Kg.) underweight for height. The principal complaint was recurrent vomiting at about a ten day interval. In this child we found stasis due primarily to a spastic sphincter ani. After a stretching of the sphincter, diet and medication there was a slow and steady gain in weight with improvement and final relief from recurrent vomiting.

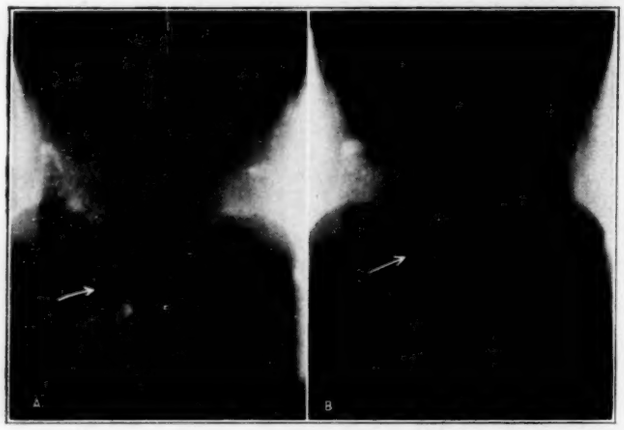

Fig. 4.—Chronic appendicitis; cecal spasm and retention. *A* was taken ninety-six hours after a barium meal; *B*, one hundred and forty-four hours after.

Fig. 5.—Bassler belt in position.

CASE 3.—A boy, aged 4 years, came to us because of severe recurrent vomiting. Figure 3 shows the barium meal tightly held in the spastic colon after seventy-two hours. The limit for intestinal emptying in a child is forty-eight hours. This child had never had a normal evacuation; enemas or drugs were required daily. In some of the seizures dextrose had been administered intravenously. A recent report from the mother, who lives at a distance, states that the boy is now perfectly well after two and a half years.

Group 3.—CASE 4.—A girl, aged 7 years, had never had a normal evacuation, enemas and laxatives being required daily. Anorexia was a prominent symptom, and recurrent attacks of vomiting were frequent. Following a barium meal the appendix showed retained barium at the end of 144 hours (fig. 4). Spasticity of the cecum was present for ninety-six hours and longer. There never had been localized signs suggesting appendical involvement, and its presence had never been suspected by previous professional attendents. This child passed from observation when operation was suggested for the removal of the appendix.

In figure 5, the Bassler belt is shown in position. This appliance is used by most of our patients with ptosis.

ABSTRACT OF DISCUSSION

DR. MAUD LOEBER, New Orleans: I believe with Dr. Kerley that the x-rays constitute an excellent adjunct to the treatment of patients showing ptoses. One might go a bit further and attempt to correct the entire posture imbalance, of which the abdominal ptosis is but a part. In addition to knowledge acquired by roentgen examination, I believe that additional data could be added with certainty, to give some valuable light on the functional status of the intestinal tract. I mean, for instance, stool examination for the determination of the digestion of the fats, carbohydrates and proteins, as well as a gastric analysis for the determination of the hydrochloric acid content. I made such a study on cases similar to those presented by Dr. Kerley. The results showed that the ability of the alimentary tract to digest various foods was materially impaired; also that in many instances the gastric secretion was definitely altered. Cases both of hypermotility and hypomotility were associated with either low or high hydrochloric acid. Thus, the observations not being uniform in relation to the clinical symptoms, I was unable to correlate delayed or accelerated emptying time, low or high acidity, with any specific clinical manifestation. Nevertheless, I obtained excellent results when the acidity of the gastric contents was brought to normal, and a modification of the elements in the diet was effected, and the impaired digestion was corrected and due attention was given to the abnormal roentgen observations and posture. In view of this knowledge, the method of treatment of children with anorexia, capricious appetite, was definitely altered, and constipation could no longer be treated with habit time or routine medication.

DR. JOSEPH S. WALL, Washington, D. C.: The most interesting group that Dr. Kerley mentioned, he placed as group 2, namely, the spastic type, and stated that occasionally these pictures revealed a condition as though a suture were tied around the bowel. Cannon, whose work was afterward confirmed by Carlson, demonstrated that at a certain point in the colon there is normally started an antiperistaltic wave, and that in both the ascending colon and the larger part of the transverse colon the natural wave is one of reverse peristalsis, starting at a point which might be called a nodal point, just exactly as there is a sinu-auricular nodal point which initiates cardiac contractions. It is reasonable to believe that perhaps in some muscular imbalance an overaction occurs at this point. One of Dr. Kerley's charts shows distinctly a small contracted colon anterior or proximal to this nodal point. It is an interesting hypothesis to believe that some of his cases were due to this antiperistalsis occurring in an extraordinary capacity. I believe, also, that sometimes one can explain the predominance of the ileocecal type of intussusception by peristaltic overriding of the ileocecal region, due to this antiperistaltic wave.

DR. C. ULYSSES MOORE, Portland, Ore.: I wish to ask Dr. Kerley, first, if he finds, as I do, that in a certain number of these cases, before treatment, there is a low percentage of gram-positive bacteria in the stools, and what the results of his treatment are as to the improvement of that bacteriologic condition. Second, whether in his cases of hypotonia he has used vitamin B in addition to his other treatment, and with what results. Third, whether there has been a study of the food allergy of certain of these patients.

DR. CHARLES G. KERLEY, New York: In presenting this contribution, I particularly desired to emphasize the importance of gastro-intestinal mechanics in its relation to gastro-intestinal

function. For a right understanding of the gastro-intestinal derangements of early life, there must be practically the same examination and study as is carried out by the gastro-enterologist in adults with gastro-intestinal disorders, taking advantage, of course, of all laboratory aids, with the serial roentgen study as the most valuable diagnostic agent.

LYMPHOGRANULOMA INGUINALE

H. F. DeWOLF, M.D.
AND
J. V. VAN CLEVE, M.D.
CLEVELAND

The term "climatic bubo" came into use late in the nineteenth century [1] to designate a subacute inguinal adenitis which was observed most often in the tropics or in the subtropics. For a long time the disease was thought to be confined to warm climates, and climate was considered to play an important rôle in its etiology. Müller and Justi [2] published a valuable paper on "climatic bubo" in 1914. The disease was not a new one, for as long ago as 1859 Chassaignac [3] described types of adenitis of the groin which certainly included a picture similar to climatic bubo. It was subsequently described under a variety of names by Klotz,[4] Nélaton,[5] Brault,[6] Hardy,[7] Marion and Gandy,[8] Tanton and Pigeon,[9] Rost [10] and other European authors. It was not until 1913, however, that Durand, Nicolas and Favre [11] pointed out the individuality of the condition and indicated its probable venereal nature. They chose the name "subacute inguinal lymphogranulomatosis" for the disease, a rather unfortunate designation because of the confusion to which it may lead. We have chosen the shorter designation, "lymphogranuloma inguinale," as this name is becoming more widely used by European writers. This name at once brings up the idea of granuloma inguinale, while in truth the only ways the two diseases resemble each other are in name and in the fact that they are both of venereal origin. Lymphogranuloma inguinale is a disease of the inguinal lymph glands, whereas granuloma inguinale is essentially a disease of the skin and subcutaneous tissue, usually in the neighborhood of the sexual organs.

A wide variety of names has been suggested for the disease under consideration: subacute inguinal lymphogranulomatosis, Durand, Nicolas and Favre, 1913; [11] climatic bubo; [1] tropical bubo; nonvenereal bubo; subacute inguinal poradenitis, Destéfano and Vaccarezza, 1923; [12] fourth venereal disease; strumous bubo of the groin, Lejars; [13] nontuberculous granulomatous lymphadenitis, Hansmann, 1924; [14] subacute inguinal lymphadenitis; maladie de Nicolas-Favre; "hypertrophic bubo," Miskjian.[15]

The World War put on end to the investigation of the disease in Europe, but since 1921 it has attracted much attention. To attempt a thorough review of the history of this disease would be a study in itself. Hellerström,[16] in his excellent monograph that appeared in 1929, included an interesting historical survey of the disease. In the United States the condition has apparently not attracted much attention. Under the name of climatic bubo it has been reported at various times, chiefly by naval medical officers.[17] Hansmann,[14] in 1924, reported a series of 4 cases under the designation of nontuberculous granulomatous lymphadenitis. Barber and Coogle,[18] 1927, reported a few cases occurring in Mississippi; they employed Hansmann's term for their cases. Hillsman, Wilshusen and Zimmerman [19] reported a case with autopsy findings in 1928. In the same year an extensive series of cases was reported by Wilmoth.[20]

Pardo-Castello [21] studied and reported 3 cases from Havana in 1925. Much work has been done on this disease in South America. Destéfano and Vaccarezza [12] have studied it thoroughly, and de Bellard has reported his observations from Venezuela on two occasions.[22]

CLINICAL PICTURE

Lymphogranuloma inguinale is a specific, autonomous venereal disease which typically involves the inguinal lymph glands in a subacute inflammation. In the majority of cases there is suppuration at several sites which ends with the development of persistent fistulas. Men are affected much more frequently than women as regards the inguinal adenitis. The recent expansion of the field of the disease to include the so-called anorectal syphiloma with stricture of Fournier and esthiomene (chronic ulcer of the vulva with elephantiasis) may decrease the apparent difference in the incidence in the two sexes. That it is a venereal disease cannot be doubted; it is not seen in children and always follows sexual exposure. The primary lesion is usually small and quite transitory. Phylactos [23] described four types of lesions occurring chiefly on the glans penis, on the prepuce or in the urethra: (*a*) ulcerated type, (*b*) nodular type, (*c*) papular type and (*d*) lymphogranulomatous urethritis.

The patient usually gives a history of a small evanescent lesion which disappears without treatment. The site is frequently undiscoverable. In a good many cases there is no history of a lesion large enough to attract the attention of the patient. Herpetiform

From the Department of Dermatology and Syphilology of the Western Reserve University and of the Cleveland City Hospital. Director, Dr. H. N. Cole.

Read before the Section on Dermatology and Syphilology at the Eighty-Third Annual Session of the American Medical Association, New Orleans, May 13, 1932.

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20. Wilmoth, C. L.: South. M. J. **21**: 108-113 (Feb.) 1928.
21. Pardo-Castello, V.: Lymphogranulomatosis Inguinalis, Arch. Dermat. & Syph. **14**: 35-45 (July) 1926.
22. de Bellard, E. P.: J. Trop. Med. **29**: 103-108 (April 1) 1926.
23. Phylactos, A.: Thèse de Lyon, 1922; quoted by Hellerström (footnote 16, first reference).

lesions have been described. Hellerström,[16] in reporting 47 cases, stated that he found lesions himself that he could consider as marking the site of inoculation in only 5 patients. In women the portal of entry is usually difficult to determine. Erosions have been noted at the fourchet and within the vagina. Primary lesions have been excised and studied histologically by several investigators, and Bory [24] claimed that the lymphogranulomatous chancre has a characteristic pathologic picture. The disease may be seen in association with other venereal conditions: syphilis, gonorrhea, chancroid and condyloma acuminatum. It has also been seen in connection with scabies.

INCUBATION PERIOD

The incubation period has been estimated by Hellerström [16] to be from ten to thirty days, this period dating from time of exposure to the onset of the inguinal adenitis. It is difficult to estimate the period from the time of exposure to the appearance of the primary lesion, as it is usually of such a fleeting character.

sionally there is never any suppuration or fistula formation.

Of late our attention has been called to an anorectal localization of the disease.[25] We do not have such clear ideas as to the early stages of this type. The earliest symptoms usually are the appearance of anal fistulas, purulent discharge from the rectum, painful defecation and finally stricture formation within the rectum. This phase of the disease has been found almost exclusively in women, a fact that has been explained on anatomic differences in lymphatic drainage. Its occurrence in men has also been observed. In these cases sodomy apparently explains the disease affecting the perirectal glands of Gerota with the production of the anorectal syndrome.

As to general symptoms shown by patients with lymphogranuloma inguinale there seems to be considerable variation. In general, the more extensive the glandular involvement, the more severe will be the systemic symptoms. Mild intermittent fever may be present, especially in the early stages, rising to higher

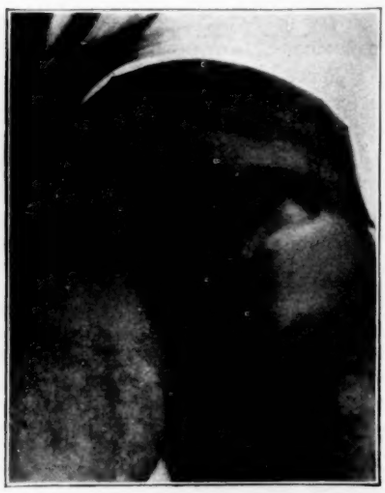

Fig. 1.—Fist-sized adenitis in a white man of 45 years. No history of a penile lesion. Scar of herniotomy on right.

Fig. 2.—Bilateral involvement in a Negro, aged 31. Positive Frei reaction on right arm. Patient also had scabies.

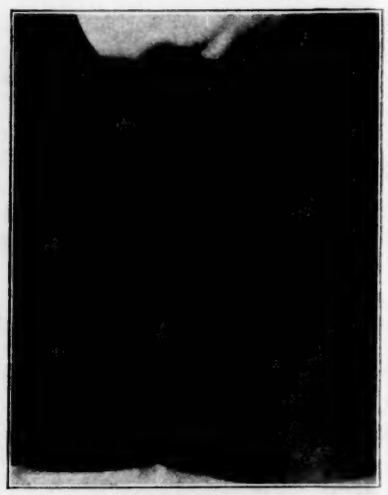

Fig. 3.—Colored woman, aged 30, with anorectal syndrome: Fistula just to right of anus.

SYMPTOMATOLOGY

The disease usually attracts the attention of the patient by the appearance of a small swelling in the inguinal region. The first glands to be involved are those of the superficial chain in the inguinal region. The disease progresses steadily, though usually slowly, to produce a mass which may reach the size of a fist, new glands becoming involved as the disease progresses, all being bound together by periadenitis. This period of invasion may extend over several weeks before the disease reaches its maximum extent. Involvement of the iliac glands occurs in a noteworthy number of cases, and French writers consider involvement of the iliac gland to be a pathognomonic sign of the disease. Pain is usually not an outstanding subjective symptom, although there is usually some tenderness on palpation of the affected glands. Sooner or later the skin becomes attached to the underlying glands and takes on a dark red or purple color. Areas of softening of individual glands in the inflammatory mass gradually appear, and if these areas are not incised, fistulas appear and drain a thin, seropurulent fluid for weeks or months. Occa-

levels at the time of invasion of additional glands. There may be weakness, anorexia, mild anemia, loss of weight and general malaise. As a rule, patients show a mild leukocytosis (from 10,000 to 12,000) and usually an increase in large mononuclear cells in the differential count. This large cell mononucleosis is claimed by some European writers to be of considerable diagnostic importance. The course of the disease is usually chronic; occasionally the adenitis may regress spontaneously, but as a rule it runs a course of weeks and months. Generally only one groin is affected, but it may begin on one side and later involve the other. Occasionally both groins may be involved simultaneously. In a case in which the perirectal lymph glands are involved, the course is even more chronic and is more productive of serious results. The stricture of the rectum, when it becomes so severe as to prevent defecation, necessitates serious surgical intervention, and not infrequently leads to invalidism and death (Jersild [26]).

24. Bory, L.: Bull. Soc. franç. de dermat. et syph. **28**: 451-458, 1921.

25. Frei, Wilhelm, and Koppel, A.: Klin. Wchnschr. **7**: 2331-2336 (Dec. 2) 1928. Frei, Wilhelm: Ibid. **4**: 2148-2149 (Nov. 5) 1925. Jersild, O.: Ann. de dermat. et syph. **1**: 577-608 (June) 1930. Barthels, C., and Biberstein, H.: Beitr. z. klin. Chir. **152**: 161-183, 1931.

26. Jersild (footnote 25, third reference).

DIAGNOSIS AND DIFFERENTIAL DIAGNOSIS

The history of an evanescent lesion of the genitalia followed by an involvement of the glands in the groin, essentially chronic in its course, should at once make one suspicious of lymphogranuloma inguinale. In differential diagnosis one must consider the possibility of chancroidal bubo, syphilitic adenitis and tuberculosis. In addition, adenitis due to simple pyogenic infection, Hodgkin's disease, malignant growths and, in some regions, pestis minor enter into differential diagnosis, but these possibilities are usually easily eliminated.

The chancroidal bubo offers the nearest clinical picture apt to be confused with lymphogranuloma inguinale. Yet there are great differences as a rule. The chancroidal bubo is a complication of the chancroid and is not a constant accompaniment of chancroidal infection, whereas in lymphogranuloma inguinale, so far as we can say, the inguinal adenitis is the essential disease picture and is not a complication of the genital lesion. At least, in the latter disease the genital lesion is usually so evanescent that it is not often observed by the time the patient presents himself for advice. The chancroidal bubo is more acute and more painful and suppurates more rapidly to form a single cavity, whereas in lymphogranuloma inguinale the bubo is subacute and relatively painless and typically suppurates at several distinct points. Rarely, there is suppuration *en masse*, with the production of a large cavity, a type that has been observed by Pautrier.[27] In chancroidal buboes one should be able to find the Ducrey bacilli in the lesions of the genitalia, and intradermal tests with chancroidal vaccine (Ito-Reenstierna reaction[28]) would be positive.

In syphilitic adenitis the glands are also hard, but they are discrete and do not have a tendency to suppurate. The primary lesion can usually be found on the genitalia. Dark-field examination either of the primary lesion or of the adenitis after aspiration puncture should go far in establishing the diagnosis of syphilis. Moreover, repeated Wassermann tests would reveal the true character of syphilitic adenitis.

The diagnosis of lymphogranuloma inguinale has been greatly simplified by the discovery Frei[29] announced late in 1925. Pus from a suppurating gland, which has not been open to external contamination, is diluted approximately ten times with physiologic solution of sodium chloride and heated at 60 C. for two hours one day and at the same temperature for one hour the following day. An emulsion of such a suppurating gland can also be used for this purpose. After culturing for sterility, this material is employed as an antigen in an intradermal test. In patients suffering from lymphogranuloma inguinale or in those who have previously had the disease, an intradermal injection of 0.1 cc. of this antigen produces an inflammatory papule within twenty-four hours which persists for several days or longer. The size of the papule varies, depending on the severity of the involvement and on the strength of the antigen employed. This cutaneous allergy develops quite early in the course of the disease, probably varying from patient to patient. In general, by the time the skin overlying the inguinal adenitis has become attached to the mass of glands, the Frei reaction will be found to be positive. This specific cutaneous sensitivity lasts for many years, perhaps during the life of the patient. Hellerström[16] has reported a positive reaction in a surgeon twenty-three years after he had accidentally infected himself while operating on the inguinal glands of a patient with a bubo of strumous character. Apparently, the Frei test is quite specific, and its positivity in a case of inguinal adenitis or in a case with anorectal signs is of almost absolute diagnostic value. It must be pointed out, however, that the same possibility must be considered as with other biologic tests; namely, that the positivity of the test does not allow a positive diagnosis of lymphogranuloma inguinale of the lesion under consideration, since an anterior infection may have been present.

27. Pautrier, L. M.: Bull. Soc. franç. de dermat. et syph. **38**: 531-533, 1931.
28. Reenstierna, J.: Arch. f. Dermat. u. Syph. **147**: 362-388, 1924.
29. Frei (footnote 25, second reference).

PATHOLOGY

When affected glands are removed by surgical excision, the excised mass is composed of glands of various sizes matted together by periglandular inflammation. On section, recently involved glands show only congestion and reddening, while glands at a more advanced stage show multiple intraglandular abscesses of variable size. The pus contained in these abscesses is whitish,

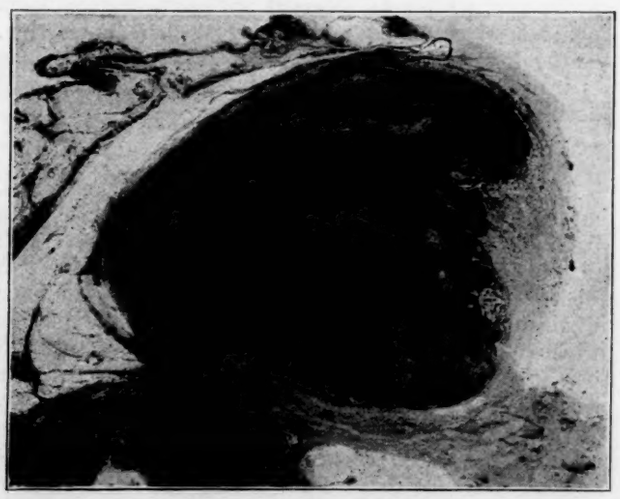

Fig. 4.—Low power view of a small gland to show intraglandular abscesses.

thick and viscid. Glands severely involved in abscess formation, on cut section and after the evacuation of their purulent contents, resemble a wasp's nest (Durand, Nicolas and Favre[11]). The histologic picture, accurately described by Nicolas,[30] shows the following structures: gummas, stellate or lenticular abscesses, epithelioid foci and giant cells. Inflammation of the glandular parenchyma diffuses and causes the normal formations to disappear more or less. The changes are greatest in the medullary portion of the glands. The gummas are formed of a central degenerated nucleus which is finely granular and surrounded by a wide band of epithelioid cells. By the migration of leukocytes of various types through the epithelioid border, the gumma is transformed into an abscess. Abscesses may be lenticular, stellate or fissured, according to their shape. Typical giant cells of large size and with numerous nuclei are encountered frequently in the border of abscesses. Around certain abscesses the epithelioid border may be thin or discontinuous or occasionally may be completely lacking. The cavity of the abscess shows many polymorphonuclear cells and large acidophilic mononuclears. In the abscesses

30. Nicolas, J.: Arch. dermato-syph. **3**: 201-243 (June) 1931.

are also a large number of pyknotic cells. Glands of lymphogranuloma inguinale also show isolated epithelioid foci with or without giant cells. These may exist in the inflamed glandular parenchyma, even beyond the wall of gummas or of abscesses. According to Nicolas,[30] the histologic picture of this disease cannot be confounded with that of any of the adenopathies studied thus far: tuberculosis, chancroidal bubo, syphilis, ordinary infection or neoplasms.

BACTERIOLOGY

Bacteriologic research of lymphogranuloma inguinale can be briefly summarized by stating that up to the present time no culturable, visible organism has been discovered as the etiologic agent. Various organisms have been found occasionally in cultures and by direct examination of pus: Bacillus fluorescens-putridus or liquefaciens,[9] ameba (Ravaut [31]), and pseudodiphtheria bacilli, but none of these have been shown to have any etiologic significance. The vast majority of attempts at culture have been entirely negative. The same is true of auto-inoculation experiments, which have proved of such great value in the study of the bacillus of Ducrey. Patients infected with lymphogranuloma inguinale seem to be immune to further inoculation, yet the disease is inoculable in human beings aside from its usual sexual transmission; for example, accidental inoculation in surgeons.

ANIMAL INOCULATIONS

Animal inoculation has been utilized for many years, but only in recent years has any real advance been made in a positive direction. On one negative fact all workers are in complete agreement; namely, that tuberculosis is not the cause of lymphogranuloma inguinale, for no animal inoculated with the pus or infected glands of this disease has developed tuberculosis. In 1924, de Bellard,[22] in Venezuela, apparently successfully transmitted the disease to a monkey by preputial inoculation. In 1930, at the International Dermatological Congress in Copenhagen, Hellerström [32] reported the successful transmission of the disease to monkeys after intracerebral inoculation. He was able to transmit the disease from one monkey to another through eleven passages, producing in them a meningoencephalitis. When cerebrospinal fluid and an emulsion of the meninges and of the brain of the infected animals were used as antigens, strongly positive intracutaneous tests were obtained on human beings suffering from this disease. His work has since been confirmed by French and German investigators. In 1931, Levaditi, Marie and Lépine [33] inoculated a patient with dementia paralytica in the prepuce with material from an infected monkey, the twelfth successful passage animal, and after thirty-five days, without observable change at the site of inoculation, the patient developed bilateral adenitis clinically identical with the adenitis of lymphogranuloma inguinale. Hellerström [34] has more recently shown that the virus is filtrable through Berkefeld and Chamberland filters, as he has been able to infect monkeys intracerebrally with such filtrates. It seems definitely proved, therefore, that the infectious agent of this venereal disease is a filtrable virus.

31. Ravaut, P.: Bull. et mém. Soc. méd. d. hôp. de Paris **45**: 865-874 (June 10) 1921.
32. Hellerström and Wassén (footnote 16, second reference).
33. Levaditi, C.; Marie, A., and Lépine, P.: Compt. rend. Soc. de biol. **107**: 1496-1497 (Sept. 18) 1931.
34. Hellerström and Wassén (footnote 16, third reference).

TREATMENT

Treatment methods may be divided into four groups: chemotherapeutic, biologic, physical and surgical. A long list of drugs has been recommended at various times, but the salts of antimony as advised by Destéfano and Vaccarezza [35] seem to give the best results. This drug is usually employed in the form of a 1 per cent solution of antimony and potassium tartrate intravenously, injections being given twice a week in progressive doses, 5 cc. up to 10 cc., in a series of from ten to fifteen doses. Biologic agents, such as the patients' own blood intramuscularly, sterile milk intramuscularly, foreign proteins intravenously and subcutaneous injections of the diluted, sterilized pus from lymphogranulomatous cases, have given inconstant results. Physical agents, such as hot air, ultraviolet rays and radiant heat, have also been of little value. Heavy, filtered roentgen treatment has been recommended for early cases. Some of the European observers have recommended surgical excision of the infected glands as early as possible, and this mode of treatment seems to offer rapid recovery. Miskjian, on this service (1923-1925), employed filiform drainage with good results in certain of these cases. As for treatment of the anorectal localization of the disease, early diagnosis by the use of the Frei test is essential. In these cases the use of antimony and potassium tartrate certainly would be indicated. If the cases are at all advanced, they are a great problem, and stricture of the rectum is inevitable.

PERSONAL EXPERIENCE

Our experience with lymphogranuloma inguinale has apparently been similar to that of other observers of the disease. For a long time it was unrecognized or at least indefinitely understood. Miskjian,[15] while working on this service (1923-1925), interested himself in the treatment of the chancroidal bubo. During the course of this work he observed several patients with unusual inguinal adenitis which he clearly distinguished from the chancroidal bubo and termed "hypertrophic bubo." He was not certain that the clinical picture was identical with that of lymphogranuloma inguinale as described by Durand, Nicolas and Favre.[11] Unfortunately, we have not been able to locate any of the patients he studied, in order to prove by application of the Frei test that they were suffering from lymphogranuloma inguinale. That cases of this disease have been seen on this service since 1923, at least goes without question.

The starting point of this study may be set early in August, 1930, when one of us (J. V. V.) prepared antigens from 2 patients with inguinal adenitis which had no explanation on the basis of chancroidal, syphilitic or other known infection. One of the patients was a white man of 38, the other a colored boy of 19. The antigens were prepared in accordance with the directions given by Frei.[29] The flexor aspect of the forearm was chosen as the site of injection. The two antigens were tried on the 2 patients, the antigens being crossed, since a reaction with autogenous antigen would be of no diagnostic value. The injections were made intracutaneously (0.1 cc.), producing a definite wheal. The results were clearcut; a definite papular reaction appeared at the site of injection within twenty-four hours. We followed Frei's advice of making the decisive reading forty-eight hours after injection, and

35. Destéfano and Vaccarezza (footnote 12, second reference).

soon learned that positive reactions may persist for days, usually increasing in intensity up to seventy-two hours. Negative reactions, on the other hand, show nothing, or practically nothing, at the end of forty-eight hours.

Since August, 1930, we have applied the test, up to March 15, 1932, on 1,010 different subjects, chiefly patients in the Cleveland City Hospital. One thousand, one hundred and three tests have been made, 93 of them being repeat tests. In 58 cases the test was found to be definitely positive. Eleven patients, on whom 21 tests were made, showed confusing reactions, neither definitely positive nor negative. They were not suffering from lymphogranuloma inguinale clinically, nor did any of them give a history of previous inguinal adenitis. Satisfactory explanation of these few confusing reactions is not available. We believe that the foreign protein in the antigens used may be the explanation, although we cannot be certain of this. To our antigens 0.25 per cent phenol is added to prevent contamination; consequently a control test is always made with 0.25 per cent phenol in physiologic solution of sodium chloride. One of our antigens made in March, 1931, remained effective for ten months and then rather suddenly lost its ability to produce reactions. Most of our other antigens were expended before many months after preparation, although two or three were potent for at least six months.

Our 58 positive cases may be conveniently divided into 4 groups: group 1, patients studied during the active manifestations of the disease affecting the inguinal glands, 31; group 2, patients treated prior to August, 1930, whom we were able to locate and on whom we applied the Frei test, 4; group 3, patients who had positive Frei reactions and who gave a history of the disease, 20; group 4, patients with anorectal disease with a positive Frei reaction, 3; total, 58.

Group 1 is made up of 10 white male patients, averaging 32 years of age, the youngest being 19 and the oldest 45; 20 colored male patients averaging 27 years of age, the youngest being 19 and the oldest 40, and one colored female patient 26 years of age. Most of these patients were tested with antigens from two different sources, but as it is usually difficult to obtain more than a small quantity of pus from most patients, some of our antigens have been of limited amounts. Furthermore, antigens lose their potency with the passage of time, as has been previously indicated. For these reasons, it was impossible in a few cases to use more than one antigen. We have prepared antigens from 11 different patients, and aside from qualitative differences, all have produced positive reactions on patients with lymphogranuloma inguinale.

The Frei test was tried in 75 cases of chancroidal infection, grouped as follows: white males, 21 cases; white females, 3 cases; colored males, 46 cases, and colored females, 5 cases.

Of the 75 patients, 41 (54.6 per cent) had buboes complicating their infection. The diagnosis of chancroid was made in 55 of the cases by finding the bacillus of Ducrey in stained smears. In 20 cases the causative organism was never found, but of these 20 cases, 13 had typical chancroidal buboes. Moreover, autoinoculation was employed in some of the 20 cases if there was any question as to the diagnosis. We are not much concerned with the 34 patients who had no bubo complicating their chancroidal infection, although it might be possible to confuse a primary lymphogranuloma inguinale lesion, so inconstantly seen, with a chancroid. Of the 75 cases of chancroid, only 2 gave positive Frei reactions. Of the 2 positive cases, 1 occurred in a patient whom we considered to have a mixed chancroidal-lymphogranuloma inguinale infection; the other patient, with no complicating inguinal adenitis, gave a history of a chronic adenitis in the right side of the groin following multiple sexual exposures about eighteen years before, and there were several old scars in the groin to bear witness to the history.

We have not been able to test our patients for chancroidal sensitivity (Ito-Reenstierna reaction[28]) until quite recently, as chancroidal vaccine (Dmelcos) does not seem to be commercially available in the United States. Furthermore, we have not personally been successful in our attempts at culturing the chancroidal streptobacillus for the preparation of our own vaccine. Through Hellerström, we have only recently received a supply of chancroidal vaccine (Dmelcos) from Europe, and in a few cases we have found that it produces positive cutaneous reactions in patients with chancroids (or who have had this disease), and, conversely, that patients with lymphogranuloma inguinale who have never had chancroids do not react to it when it is injected intracutaneously in exactly the same manner as the Frei antigen is employed. Since the chancroidal bubo is, practically speaking, the only other type of inguinal adenitis easily to be confused with lymphogranuloma inguinale, it is evident that the application of the Ito-Reenstierna reaction is of great value in differential diagnosis.

In 84 cases of early, active syphilis (primary or secondary) the Frei reaction proved to be negative. We have not seen the two diseases associated in the active stages in this series, although we have found 7 patients in the 31 cases comprising group 1 who had latent syphilis. Six patients of the same group had active gonorrhea, and of the 6 patients 2 also had latent syphilis. In 58 cases of uncomplicated gonorrhea, the Frei test was negative in 54 instances and positive 4 times. The 4 patients with positive reactions all gave a history of a previous chronic adenitis of the inguinal region.

Group 2 comprises 4 patients. Because of the unsatisfactory diagnosis of about 30 cases of chronic inguinal adenitis in which the patients were treated between 1924 and August, 1930, we attempted to locate the patients and apply the Frei test. Unfortunately we were able to find only 4 of this number, 1 white man, 2 colored men and 1 colored woman. These 4 patients had been hospitalized between June, 1927, and November, 1929, because of unusual inguinal adenitis, and in all 4 the Frei test was strongly positive from two to four and a half years after their disease was active. All showed evidence of the healed inguinal adenitis (scars of fistulas or fibrosis).

Group 3 comprises 20 patients who, on extensive application of the Frei test on the dermatologic, medical, surgical and tuberculosis services of the City Hospital, gave clearcut positive reactions to the lymphogranuloma inguinale antigens. These patients were all men, except one colored woman, and all gave a history of a persistent inguinal adenitis of unusual character, "not like most blue-balls," in the words of several of the male patients. One patient, a Negro, 60 years of

age, said that his adenitis occurred when he was 21 years old while he was living in the South. A white man, aged 51, stated that he had suffered from the disease twenty-five years previously while living in Italy. The others gave fairly reliable histories of the disease from five to twenty years previously. While we do not lay great stress on this group of patients, we feel that we have some fairly reliable facts as to the past incidence of the disease among a class of patients such as is seen in this hospital (20 positive tests in about 970 different patients). The long persistence of the cutaneous allergy is also clearly shown by this group.

Group 4 comprises 3 cases of anorectal syndrome, 1 white man, 1 white woman and 1 colored woman. The white man, aged 31, was admitted on March 4, 1932, with a chronic rectal disease dating from 1919. He alleged that it followed a forced rectal exposure while a guard-house prisoner in the army. He had been operated on 6 different times and stated that he had received a large number of injections of arsphenamine without any benefit. Physical examination revealed several edematous, whitish plaques around the anus, a gaping anal opening (sphincter removed) and a dense stricture of the rectum. There was no evidence of an old inguinal adenitis and there were no penile scars. The Wassermann and Kline tests gave negative reactions on 2 occasions. The Frei test was strongly positive on 2 occasions with 2 different antigens.

The white woman, aged 35, had suffered from rectal trouble for several months. On admittance to the hospital she was found to have cerebrospinal syphilis, a fact of which she was not aware. There were an anal fistula and a diaphragm-like stricture of the rectum 2 inches (5 cm.) above the anus. The Frei test was strongly positive with 2 antigens. The Ito-Reenstierna reaction was negative. Smears were negative for gonococci. Tuberculosis has not yet been definitely excluded. There were no edema of the vulva and no evidence of inguinal adenitis.

The colored woman, aged 30, had had hemorrhoids for about eighteen months. Recently this complaint had become much worse, and a purulent vaginal and rectal discharge developed. There were a single anal fistula and a dense, sickle-shaped stricture of the rectum. There was evidence of perimetritis, and a fistula entered the vagina from the perirectal glands. There was no evidence of inguinal involvement. Pulmonary tuberculosis has been excluded by roentgen examination. The Frei test was strongly positive; Wassermann and Kline tests have repeatedly given negative results during two months of observation. Smears of the pus from the vagina and from the rectum have been negative for gonococci.

Bacteriology.—We have examined stained smears from the few local lesions we have seen (8 lesions in the 31 patients of group 1) with negative results as regards the bacillus of Ducrey with 1 exception. In this case, because of the clinical appearance of the inguinal adenitis together with the positivity of the Frei test, we considered the patient to have a mixed chancroidal-lymphogranuloma inguinale infection. Pus obtained by aspiration or from glands removed surgically has been examined in stained smears and by dark-field illumination with negative results. The same is true of examination of many tissue sections stained for acid-fast organisms and for spirochetes. Attempts at culture on various types of aerobic mediums have been negative with the exception of one case; in this instance a culture of an acid-producing bacillus, probably Bacillus acidophilus, was obtained only on Loeffler's serum agar.

Animal Inoculation.—Pus from 3 of our cases was injected into guinea-pigs, either subcutaneously or intraperitoneally. In 7 of the animals examined pathologically there was found no evidence of tuberculosis or of any other disease, either grossly or microscopically. Two animals, into the groins of which fresh pus obtained from glands at operation was injected, developed no evidence of adenitis of the inguinal glands after six weeks of observation, and the animals appeared to be perfectly well.

Pathology.—Pathologic examination of the glands of 5 patients treated surgically has revealed both gross and microscopic pictures in entire accordance with the descriptions given by various European writers.

Treatment.—Treatment has been medical for the most part with rather unsatisfactory results as regards materially shortening the course of the adenitis. We have used intravenous injections of typhoid vaccine extensively, injections of the lymphogranulomatous antigen subcutaneously and intramuscularly in a few cases, aspiration, filiform drainage, hot applications and, of course, rest. A few of our patients were treated with small, filtered doses of roentgen rays with no striking results. Recently we have begun the use of a 1 per cent solution of antimony and potassium tartrate intravenously as advised by Destéfano and Vaccarezza,[35] but our experience with this drug has been too short to allow us any definite conclusions as to its efficacy. Five of our patients with lymphogranuloma inguinale (4 white men and 1 colored man) have been treated by excision of the involved inguinal glands with good results in the first 4 so treated. The fifth has only recently been thus treated.

SUMMARY

1. Lymphogranuloma inguinale, sometimes termed "climatic bubo," is a specific venereal disease. It is characterized by a persistent, subacute inflammation of the inguinal lymph glands which often produces fistulas. The cause is apparently a filtrable virus.

2. In the male, infected by sodomy, and much more frequently in the female, there is an involvement of the perirectal glands with the production of anal fistulas and stricture of the rectum (anorectal syphiloma of Fournier, formerly supposed to be due to syphilis only).

3. Antigens have been prepared from 11 of our cases according to the technic described by Frei.[29]

4. With these 11 antigens 1,103 intradermal tests were made on 1,010 patients with various types of disease. Fifty-eight patients were found to react positively to the test and either showed definite clinical evidence of the disease or gave a history of a chronic, inguinal adenitis.

5. In our 31 cases showing active inguinal manifestations of the disease, the best therapeutic results were achieved by surgical removal of the involved inguinal glands before the formation of fistulas.

6. We would recommend that all cases of rectal stricture be investigated from the standpoint of lymphogranuloma inguinale.

ABSTRACT OF DISCUSSION

DR. FRED D. WEIDMAN, Philadelphia: This is indeed a large experience which the authors have related. All will recall Pardo-Castello's report of the disease several years ago, but this is the first report of a large series in the United States. Perhaps no dermatologist in the United States can tally so big a score. This is no doubt due to the fact that dermatologic as well as urologic cases are admitted to the wards of the hospital with which the authors are connected. I do not know to just what extent the urologists and venereal specialists in general have taken up this disease. I should be interested to know whether the disease is being recognized by them as it should be. This is another instance of the tuberculoid reaction, another stumbling block for the histopathologist, and it exemplifies once more how difficult it is to diagnose a disease from the sections themselves. Whereas the palisade arrangement of the cells was pointed out, the same thing can occur in other disorders, in granuloma inguinale for instance. I should like to be informed by the authors whether the same sort of histologic picture is given in the skin as in the lymph nodes. In the sections from the lymph nodes there are most extensive accumulations of lymphoid cells, peripheral to the endothelioid ones, and I should like to know whether it is the same in the skin. The third point I would bring up is the nature of the antigen. I think we are all struck by its crudeness. It is nothing more nor less than pus that has been sterilized. It may be that it is not the organisms in themselves which contribute to the specificity of this antigen, but body products that are provoking the reaction. If no more than from the academic direction, it might be well to attempt to fractionate this crude material in a effort to illuminate this point. I should like to know whether this has been done, and, in line with it, whether antigen has been prepared from nodes that were not actually suppurative, and whether this likewise gives the specific reaction.

DR. ELMO D. FRENCH, Miami, Fla.: I live in the so-called American tropics and have been on the lookout for this disease. I have questioned urologists about its occurrence in the Miami district. So far I have seen the disease only twice. I think one should be a little more hesitant about calling this a tropical disease. Dr. Weidman just mentioned that Dr. Pardo-Castello has reported a number of these cases, and it is interesting that within a few miles of his home this must be a rare condition. I think that hygiene plays a greater part in these cases than is realized.

DR. LESTER HOLLANDER, Pittsburgh: I should like to ask about the false positive reactions the authors have obtained.

DR. HAROLD N. COLE, Cleveland: In my estimation, lymphogranuloma inguinale is not a rare disease. No special effort has been made in Cleveland to collect these cases. They began to be noticed in 1924. One or two of these cases are constantly present in the wards and sometimes more than that. I think that when I left home there were four or five cases. They are simply culled out of the patients of the different hospitals and are sent in for treatment, because we realize that they will be very interesting. Dr. Mook told me that in France he made notes on three similar cases which he was convinced were different from what he had seen before but which he classified as venereal disease. He spoke to Professor Darier about them and he said he was not sure about the condition but thought that it had been recently investigated and described by some physicians at Lyons. I think the disease is well distributed both in Europe and in this country, and certainly it is well distributed in South America. The primary lesion is difficult to study because it is so evanescent. The lesion lasts only a day, or two or three days, and disappears. Only rarely have we had an opportunity to study a primary lesion. In but one instance was some primary material given to a pathologist; without knowing anything about it he sent back word that it looked like the picture of lymphogranuloma inguinale in the lymph nodes. The frei test is specific in the disease and the sensitivity persists, apparently for life. Whether a lifetime immunity also persists, we are as yet unable to say. As to the treatment, we have not been using antimony and potassium tartrate very long but since we have used this preparation we have had some very good results and will plan on using more of it in the future. In reply to Dr. Weidman about the antigen, we have tried a scheme which, so far as I know, has not been tried elsewhere. We have taken the antigen and run it through a Berkefeld filter and the filtrate, strange to say, will not give the reaction. There must be something in the broken down tissue of the lymph node which causes the reaction. What it is it is hard to say but one does get a reaction in lymphogranuloma inguinale and not in any other disease. I think if one looks for these cases in the clinics one will find that it is not such a rare disease.

DR. HOWARD FOX, New York: I should like to know how long the antigen remains active.

DR. J. V. VAN CLEVE, Cleveland: In reply to Dr. Weidman about the skin being involved, we have performed four punch biopsies over the adentitis. Of course, the skin was removed at the time and none has shown any evidence of this disease although, as Dr. Cole pointed out, the primary lesion on the penis has an appearance simulating somewhat the lymph node involvement. The antigen has not been studied except culturally and by injections into animals. Dr. Cole answered the rest of that question. With regard to the false positives we have obtained, there were only eleven we could call false positives out of 1,000 run. The antigen used is an alcoholic one and in each case in which a false positive was run we used another antigen. European writers have noted that their antigen remains active for six or eight months. We have some antigen that is still active at the end of nine months, although I think that from six to eight months is the average. This is only a preliminary report, for we are seeing these patients all the time. We shall try to follow up the work and have something more tangible to report on another occasion.

XANTHOMA MULTIPLEX

TWO CASES INVOLVING THE LARYNX AND TRACHEA, AND ASSOCIATED WITH DIABETES INSIPIDUS

WILLIAM P. FINNEY, M.D.
HAMILTON MONTGOMERY, M.D.
AND
GORDON B. NEW, M.D.
ROCHESTER, MINN.

The following two cases are reported chiefly because of the rarity with which xanthoma has been known to attack the upper part of the respiratory tract. Xanthoma as an entity was first described in 1851 by Addison and Gull,[1] who observed both the plane variety affecting eyelids only, and the nodular variety scattered over trunk and limbs. The name vitiligoidea suggested by these authors was soon replaced by xanthoma, and descriptive terms were added, such as planum, multiplex and tuberosum. Under such names many clinical descriptions of xanthoma multiplex have been published. Usually the author has reported his case because of some peculiar distribution of the lesions, or because of the association of xanthoma with some other disease. Nodules or plaques have been found on practically every part of the external surface of the body. Most rarely the cornea is affected, only four such instances being reported previously.[2] In our

From the Division of Medicine, the Section on Dermatology and Syphilology, and the Section on Laryngology, Oral and Plastic Surgery, the Mayo Clinic.

1. Addison, Thomas; and Gull, William: On a Certain Affection of the Skin: Vitiligoidea—α Plana, β Tuberosa, with Remarks and Plates, Guy's Hosp. Rep. **7**: 265-276, 1851.

2. Gaucher and Herscher: Xanthélasma de la cornée, Ann. de dermat. et de syph. **30**: 961-964, 1899. von Graefe, A.: Ein Fall von eigenthümlichen Tumeren auf Hornhäuten, Berl. klin. Wchnschr. **4**: 323 (Aug. 5) 1867. Hirschberg: Ein Fall vorgestellt von multipler Geschwulstbildung in der Haut gleichfalls eine Fremdbildung auf der Hornhaut, ibid. **11**: 354-355 (July 20) 1874. Pusey, W. A., and Johnstone, O. P.: A Case of Xanthoma Diabeticorum and Lipoma Multiplex and a Case of Xanthoma Approaching the Diabetic Type with Diabetes Insipidus, J. Cutan. Dis. **26**: 552-562 (Nov.) 1908. Schwartz, H. J., and Busman, G. J.: Xanthoma Diabeticorum, Arch. Dermat. & Syph. **21**: 701 (April) 1930. Virchow, Rudolf: Ueber Xanthelasma multiplex (molluscum lipomatodes), Virchows Arch. f. path. Anat. **52**: 504-510, 1871.

second case there was one xanthomatous deposit on each cornea. Xanthomatous lesions have also been described on many internal surfaces; in the mouth, esophagus and trachea, on the peritoneum, liver and spleen, in the bile ducts, on the valves of the heart, in the central nervous system in the region of the pituitary and pineal glands and elsewhere. Involvement of tendon sheaths is common. In the first ten cases reported in London, xanthoma was seen on the mucous membrane of the mouth or pharynx four times; in three of these four cases it was found at necropsy in the larynx or trachea also.[3] It may be that in subsequent years careful examination would have revealed involvement of the respiratory tract more often, but we found only sixteen cases reported in which the mucous membrane of the mouth or pharynx was affected; in only three of these did lesions extend into the larynx or trachea,[4] and in one instance tracheotomy was necessary.[5]

In 1882 a list of twenty-eight cases of xanthoma multiplex occurring in adults was published;[6] twenty-three of the patients suffered from chronic jaundice. Thus, the idea early arose that the condition was caused by some disturbance of metabolism. With modern improvement in surgery of the gallbladder, chronic jaundice has become uncommon and consequently is seldom found associated with xanthoma. Diabetes mellitus was next thought to be an important predisposing cause; one of Addison's original patients had diabetes. In 1924, Major[7] reviewed seventy-four cases of xanthoma diabeticorum, adding three of his own. Early histologic and chemical studies had shown that xanthomatous nodules contained cholesterol or other fats. Chambard[8] stated that Quinquaud had found cholesterol and fats increased in the blood as early as 1874. Pinkus and Pick[9] in 1908, pointed out that hypercholesterolemia was the factor in common between the conditions of chronic jaundice and diabetes mellitus; they suggested that xanthomatous nodules in the skin were analogous to deposits of amyloid. As methods improved for the quantitative determination of lipids in the blood, hypercholesterolemia became a frequent finding and for a time was believed to be an essential antecedent of xanthoma. A more recent modification of this theory stated that "the quantitative ratio of lipid constituents in the blood is deranged."[10] At present it is generally believed that some abnormality in lipid metabolism plus some local factor in the tissues makes possible the deposition of lipids in xanthomatous lesions. Rowland[11] has pointed out the probable relationship between xanthoma and Gaucher's disease, Schüller-Christian's syndrome (xanthomatosis), and Niemann-Pick's disease. There is a small group of cases in which diabetes insipidus is present. Occasionally lesions develop at the site of trauma. There are numerous instances of occurrence in two or more members of a family. There remain, however, many cases in which no predisposing cause is found and in which cutaneous xanthomatous deposits occur without associated demonstrable disturbance of metabolism.

Although lesions may vary greatly in number, size and distribution, the histopathologic picture is similar for all types of xanthoma; rather arbitrary divisions may be made; an early or inflammatory stage, a tumor stage, and a stage of regression or fibrosis. The most prominent feature is the presence of the xanthoma or foam cells which, when stained for fats, are seen to be laden with various lipids and are apparently derived from the reticulo-endothelial system. Frequently, especially in the tumor stage, numbers of "Touton" giant cells are seen; these are characterized by a central circular arrangement of their nuclei with a peripheral zone of lipid-containing cytoplasm.

At the Mayo Clinic there have been twenty-six cases in which the diagnosis was xanthoma multiplex. Only one of the patients had jaundice but two others had gallstones, five had diabetes mellitus, two had syphilis, and one had exophthalmic goiter. In two cases there was a definite history of preceding trauma at the site of the lesions. In sixteen cases determinations were made of cholesterol and fats in the blood, and figures higher than normal were obtained in nine.

Treatments of many kinds have been tried with little success. Single nodules may be removed by the knife or cautery, or by chemicals. In a very few instances, treatment by roentgen rays is reported to have been successful. In a considerable number of cases in which diabetes mellitus is associated, improvement is noted on a dietary regimen with or without insulin. Wile[12] has called attention to the involution of lesions in some cases when hypercholesterolemia is reduced by a diet low in total calories. Spontaneous disappearance has been known to occur, but the disease may last indefinitely. Mackenzie[13] observed two brothers and a sister, aged 45, 47 and older, all three of whom had had multiple lesions since early infancy without material progress or regression.

REPORT OF CASES

CASE 1.—A man, aged 27, who had always been healthy, was first seen in September, 1931. About four years previously he had noticed yellowish-brown spots in the axillae. In a year's time the lesions had increased in number, size and distribution to their state observed at examination, and there had been little if any change in the last three years. About one year after onset of the xanthoma, polyuria had suddenly developed without any accompanying illness or nervous shock. Since that time the patient had regularly passed about 6 liters of urine daily, and he had suffered moderately from thirst. This diabetes insipidus had been readily controlled by hypodermic injection of solution of pituitary, but the patient had not been sufficiently bothered by the symptoms to continue the use of the drug regularly.

General examination was essentially negative except that the patient was somewhat under normal weight, seemed rather weak, and became dyspneic on exertion. Flat, pale, yellowish

3. Fagge, C. H.: General Xanthelasma or Vitiligoidea, Tr. Path. Soc. London **24**: 242-250, 1873. Legg, J. W.: Hydatids of the Liver, Omentum and Rectovesical Pouch; Compression of the Hepatic Duct; Jaundice; Xanthelasma Multiplex, ibid. **25**: 155-166, 1874. Moxon, W.: Simple Stricture of Hepatic Duct, Causing Chronic Jaundice and Xanthelasma, ibid. **24**: 129-134, 1873.

4. Chambard, E.: Du xanthélasma et de la diathèse xanthélasmique, Ann. de dermat. et de syph. **10**: 241-258, 1879-1880. Pusey and Johnstone (footnote 2). Siemens, H. W.: Zur Kenntnis der Xanthome, Arch. f. Dermat. u. Syph. **136**: 159-197, 1921; Ueber ungewöhnlich ausgebreitete Xanthomatose ohne Hypercholesterinämie, ibid. **138**: 431-433, 1922.

5. Rhodes, J. E.: A Case of Xanthoma Multiplex with Interesting Throat Complications, Laryngoscope **16**: 801-806 (Sept.) 1906.

6. Hutchinson, Jonathan; Sangster, Alfred, and Crocker, H. R.: Table of Cases of Xanthoma Multiplex in Adults, Accompanied by Jaundice, Tr. Path. Soc. London **33**: 381-383, 1882.

7. Major, R. H.: Xanthoma Diabeticorum, Bull. Johns Hopkins Hosp. **35**: 27-30 (Jan.) 1924.

8. Chambard, E.: Du xanthélasma et de la diathèse xanthélasmique, Ann. de dermat. et de syph. **10**: 363-398, 1879-1880.

9. Pinkus, F., and Pick, L.: Zur Struktur und Genese der symptomatischen Xanthome, Deutsche med. Wchnschr. **34**: 1426-1430 (Aug.) 1908.

10. Bloch, Bruno: Metabolism Endocrine Glands and Skin Disease with Special Reference to Acne Vulgaris and Xanthoma: II. The Pathogenesis of Xanthoma, Brit. J. Dermat. **43**: 65-76 (Feb.) 1931. Schaaf, Fritz: Der Lipidstoffwechsel, Zentralbl. f. Haut- u. Geschlechtskr. **35**: 193-213, 1930.

11. Rowland, R. S.: Xanthomatosis and the Reticulo-Endothelial System, Arch. Int. Med. **42**: 611-674 (Nov.) 1928.

12. Wile, U. J.; Eckstein, H. C., and Curtis, A. C.: Lipid Studies in Xanthoma, Arch. Dermat. & Syph. **19**: 35-49 (Jan.) 1929.

13. Mackenzie, Stephen: Two Cases of Congenital Xanthelasma (Living Specimens), Tr. Path. Soc. London. **33**: 370-372, 1882.

infiltrations were seen on the upper and lower lids of both eyes; there was a flat, fairly solid, pinkish-yellow plaque 3 cm. in diameter on the chin; there were three or four separate nodules on the lower lip. Both axillae were covered with soft, yellowish-brown nodules of variable size, tending to become confluent. There were scattered nodules on the neck, trunk and groins; quite striking was the absence of lesions on arms and legs, on extensor surfaces, and on areas subject to trauma. The scrotum and perineum were involved, but smooth, flat infiltrated areas were present more like those on the face than the nodules on the body. On the sternum was a pedunculated yellowish tumor 4 by 2 by 2 cm., which the patient said had grown rapidly in the last three or four months. His voice was husky, and he complained of difficulty in swallowing. In the mouth many yellowish, elevated areas were seen on the mucous membrane of the palate, tonsillar pillars and posterior pharyngeal wall, extending down and involving the epiglottis. There was marked scarring of the pillars and the soft palate, so that there was a nasopharyngeal stricture with an opening into the nasopharynx about 0.5 cm. in diameter. The epiglottis was contracted on itself laterally and drawn down posteriorly so that it covered the opening of the glottis. The arytenoids only could be seen. It was impossible to retract the epiglottis to get a view of the glottis (fig. 1). Tracheotomy was thought advisable, as the patient had considerable dyspnea on slight exertion.

The disk of the tracheal cartilage removed at the time of tracheotomy showed xanthomatous plaques. Biopsy was made

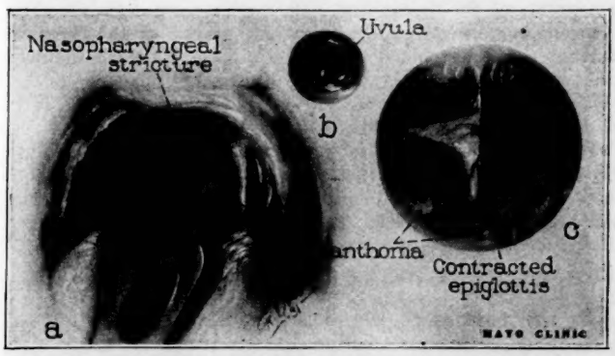

Fig. 1 (case 1).—Xanthomatous deposits in the pharynx with deformities causing dyspnea.

of a nodule from the axilla and of the pedunculated tumor on the thorax. All sections from different areas revealed typical pictures of xanthoma (figs. 2 and 3). Various stains for fat revealed xanthoma cells laden with lipids.

The output of urine averaged 6,000 cc. in twenty-four hours; its specific gravity ranged from 1.003 to 1.009; there was no albumin, and microscopic examination was negative. The concentration of hemoglobin was 12 Gm. (75 per cent); erythrocytes numbered 4,520,000 and leukocytes 16,400 and 11,700 in each cubic millimeter of blood. Serologic tests for syphilis were negative. Roentgenograms of the thorax, the trachea, the esophagus and the sella turcica were normal. The eyegrounds were normal. Analysis of the chemical constituents of the blood gave these figures for each hundred cubic centimeters: sugar, 80 mg.; sugar tolerance after 100 Gm. of dextrose, fasting 90 mg., a half hour 130 mg., two hours 130 mg., three hours 80 mg.; no sugar appeared in the urine; urea, 12 mg.; cholesterol, 172 mg.; total lipoids, 461 mg., and fatty acids, 289 mg. Two months later another analysis gave cholesterol 185 mg., cholesterol esters 166 mg., total lipoids 565 mg., fatty acids 380 mg., and lecethin 240 mg. The tumor from the thorax and a nodule from the axilla were analyzed chemically for various lipids; these observations with similar analyses from other cases will be reported in another paper by one of us.

Various treatments were tried. Roentgen-ray exposures were made over the face and neck. The patient was kept on a diet low in fat and calories for two weeks and was given small doses of insulin during the same period. Hypodermic injections of 1 cc. of either solution of pituitary or pitressin reduced the daily output of urine from 6,000 cc. to 4,000 and 2,400; and 2 cc. daily reduced it to 2,300 and 1,100. No effect resulted from the use of pitressin nasal jelly. None of these measures had caused any change in the cutaneous lesions after five months.

CASE 2.—A man, aged 42, first seen in June, 1927, had noticed increased thirst and polyuria in November or December, 1925. He would drink about twenty glasses of water during the day and would wake up at night because he was thirsty. He could not remember any illness or other incident which

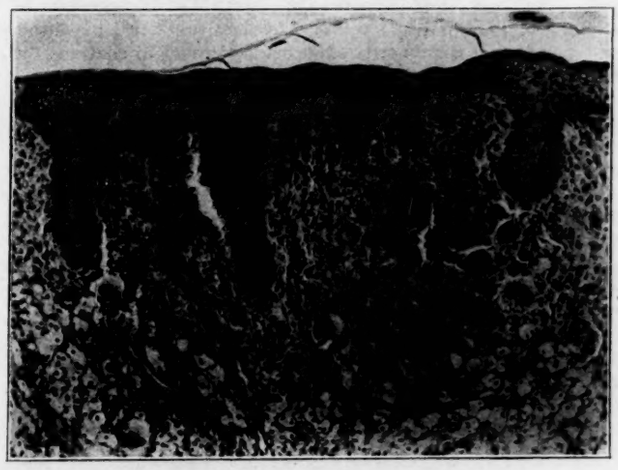

Fig. 2 (case 1).—Biopsy from axilla disclosed typical pale staining vacuolated xanthoma cells; also "Touton" giant cells; slightly reduced from a photomicrograph with a magnification of 75 diameters.

might have brought on the condition. About the same time he noticed yellowish-brown, elevated areas on the skin of the antecubital fossae. It seems probable that the appearance of these lesions antedated the onset of diabetes insipidus but that they were not striking enough to attract the patient's attention for some time. Similar soft tumor-like nodules presently appeared

Fig. 3 (case 1).—Biopsy from trachea disclosed pale staining vacuolated xanthoma cells; slightly reduced from a photomicrograph with a magnification of 165 diameters.

in both axillae and on the sides of the neck, and smaller paler plaques under the eyes. At his first visit general examination was essentially negative except for the lesions on the skin in the areas mentioned. He was found to be passing not more than 2,000 cc. of urine daily and his oral fluid intake was recorded as not more than 2,200 cc. The specific gravity of the urine varied from 1.006 to 1.012. Roentgenograms of the sella turcica were negative. The blood sugar was 0.10 per cent; the basal metabolic rate was normal, +3 per cent. A biopsy made from one of the nodules in the axilla revealed the typical picture of xanthoma.

The patient returned to the clinic in January, 1932, showing marked increase in the number and extent of xanthomatous lesions, as compared with the status shown by photographs taken at the time of his previous visit. The progression had been so gradual, however, that he could not say whether they were still increasing or were stationary. About two years before this last visit, xanthomatous nodules had appeared around the anus and had been excised because of itching. They had recurred in an area of larger radius, and the itching associated with them formed his chief complaint. His thirst and polyuria were of less degree, he thought, than on his former visit. He had tried hypodermic injections of solution of pituitary in 1927 and had found that they controlled his thirst, but he had not experienced sufficient discomfort to continue the use of the drug.

Examination disclosed large areas of soft, confluent bronze-colored nodules in each axilla (fig. 4). There were smaller areas in each antecubital fossa, where the nodules were pinkish-brown; some of these tumors were slightly pedunculated and as large as 2 by 1 by 1 cm. There were numerous smaller flat nodules on the neck, face, groins and sides of the abdomen. Around the anus for a radius of from 6 to 7 cm. the skin appeared smooth, gray and thick, perhaps owing in part to previous excision of nodules; at the periphery of this area were soft, sessile, pinkish tumors like those in the hollows of the elbows. A continuous ridge of xanthomatous tissue ran along the median raphe to the scrotum, where it ended in several nodular enlargements. Again, it was interesting to note that there were no lesions on the elbows, knees or surfaces subject to trauma. In the mucous membrane of the mouth

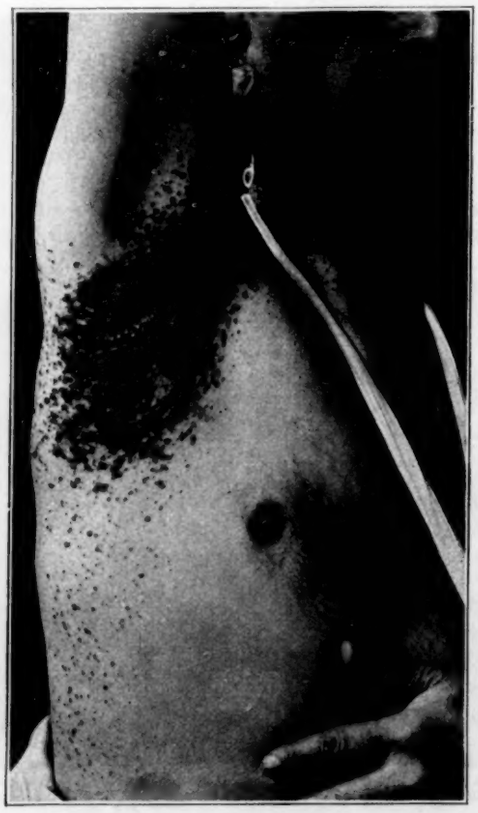

Fig. 4 (case 2).—Xanthomatous nodules, axilla and neck. Pictures of the same areas in case 1 were almost identical.

there appeared five yellowish areas, one on the left margin of the tongue, one in each cheek, one in the left lower jaw and one in the uvula (fig. 5). There was no involvement of the posterior pharyngeal wall or scarring, as was present in case 1. There were eight areas visible in the larynx and upper part of the trachea where the mucous membrane was similarly involved. As far as one could see down the trachea, the same condition was present. There was no scarring in the larynx or trachea and no embarrassment of respiration. On the upper part of each cornea, covering the upper margin of the iris, was a yellow, slightly elevated mass resembling so closely some of the other nodules, particularly those in the mouth, that there seemed no reasonable doubt of their identical nature. Biopsy was made from a nodule on the arm and again revealed typical xanthoma, not differing essentially from the picture seen five years before in tissue from the same patient, nor from that seen in sections made from the first patient (case 1).

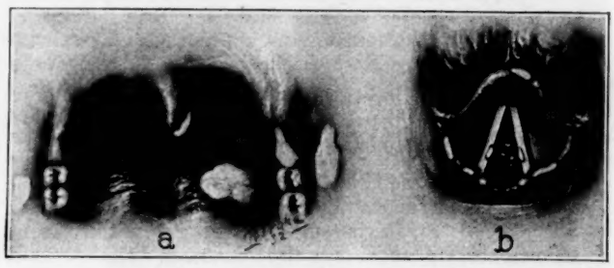

Fig. 5 (case 2).—Xanthomatous deposits in mouth and larynx.

General examination was essentially negative except for the lesions described. The output of urine was between 2 and 3 liters daily, the specific gravity was 1.010 per cent; urinalysis was negative. The concentration of hemoglobin was 10.8 Gm. (64 per cent); erythrocytes numbered 3,540,000, and leukocytes 11,700. Serologic tests for syphilis were negative. Roentgenograms of the thorax and sella turcica were negative. The eyegrounds were essentially normal. Analysis of the chemical constituents of the blood gave these figures for each hundred cubic centimeters: urea 22 mg., sugar 94 mg., cholesterol 167 mg., cholesterol esters 119 mg., lecithin 246 mg., fatty acids 273 mg., and total fats 440 mg.

Treatment was begun as in the other case. Roentgen-ray exposures were made to the region of the sella turcica, both sides of the neck, and the right arm. A diet low in calories and low in fat was tried. There was no improvement during the period that the patient remained under our observation.

COMMENT

In the two cases the distribution of the cutaneous lesions was similar and tended to involve flexor surfaces and protected areas. This is in contrast to most cases of xanthoma tuberosum multiplex or xanthoma diabeticorum, in which lesions are more commonly found on extensor surfaces and areas exposed to trauma. Both patients had mild diabetes insipidus controllable by solution of pituitary; in one case surely, and in the other case probably, the appearance of xanthoma preceded the onset of polyuria, in neither was any tendency shown for the polyuria to progress in severity. When diabetes insipidus occurs together with xanthoma, it is usually assumed that a xanthomatous deposit has occurred in the region of the pituitary gland or the floor of the third ventricle. This has been proved in at least one case.[14] It may also be noted that neither of these patients had any chronic disease affecting lipid metabolism nor was there any chemical abnormality demonstrable in the blood. Slight deficiency of hemoglobin and slight leukocytosis existed in both cases. Both patients complained of decrease in ambition and energy of moderate degree; the explanation of this is not apparent. We were not able to alter the appearance of the cutaneous lesions by methods which have occasionally been attended by success in the hands of others.

14. Griffith, J. P. C.: Final Report on a Case of Xanthoma Tuberosum with Diabetes Insipidus, Arch. Pediat. **40**: 630-631 (Sept.) 1923. Weber, F. P.: Cutaneous Xanthoma and "Xanthomatosis" of Other Parts of the Body—Pituitary Xanthomatosis—"Xanthomyelomata" of Tendon-Sheaths, etc., and the "Cholesterin Diathesis," Brit. J. Dermat. **36**: 335-370 (Aug.-Sept.) 1924. Weidman, F. D., and Freeman, Walter: Xanthoma Tuberosum, Two Necropsies Disclosing Lesions of the Central Nervous System and Other Tissues, Arch. Dermat. & Syph. **9**: 149-175 (Feb.) 1924.

THE VALUE OF SALMON OIL IN THE TREATMENT OF INFANTILE RICKETS

MARTHA M. ELIOT, M.D.
E. M. NELSON, PH.D.
SUSAN P. SOUTHER, M.D.
AND
M. KATHARINE CARY, A.B.
NEW HAVEN, CONN.

Fish oils, notably cod liver oil, have long been known to be the best natural source of the antirachitic vitamin. For some time it has been known that salmon oil contains vitamin D,[1] but until recently the oil has been considered to be of relatively slight [2] or of only moderate [3] vitamin D potency as compared with cod liver oil and has not been used in the treatment of infantile rickets. In 1931, Tolle and Nelson [4] showed by biologic assay that salmon oil, when prepared in such a manner as to conserve its maximum vitamin A and vitamin D potency, is at least as powerful an antirachitic agent as cod liver oil and may be twice as potent. Contrary to the reports of others,[5] these investigators were also able to show that the vitamin A content of oil from certain species of salmon may be as high as that of average cod liver oil. It is our purpose in this paper to report clinical tests of the value of salmon oil in the treatment of infantile rickets.

In their biologic assays of salmon oil, Tolle and Nelson used three different preparations of oil—oil specially prepared from the waste products of the salmon canning industry (so-called offal oil), oil prepared from commercially canned salmon, and commercial salmon oil. The oils that were prepared by these investigators from the waste products of the salmon canning industry showed the greatest concentration of vitamin D, the oils from three species, Humpback or Pink, Sockeye or Red, and Chinook or King being fully twice as potent as average cod liver oil; that from Chum or Keta 50 per cent more potent; and that from Coho or Silver equal in potency. Of the samples of oil from canned salmon, two species, the Sockeye and the Humpback, were also approximately twice as potent in vitamin D as average cod liver oil. The commercial salmon oils tested were not superior to cod liver oil in vitamin D.

These authors also showed that the oils from different species of salmon varied widely in their vitamin A potency, and that there was a rather striking correlation between depth of color and vitamin A content. The oils showing a distinct reddish cast, such as Chinook or Sockeye, contained much more vitamin A than Chum, which has practically no red color and gave practically no response when fed in the same quantities. The Humpback or Pink and the Coho or Silver fell between in vitamin A potency. The oils prepared from salmon waste products and the commercial oils were greatly superior in vitamin A to oils prepared from canned salmon. From the studies of Tolle and Nelson, it would appear then, that oil can be prepared from the waste products in the manufacture of canned salmon that is approximately twice as high as a good grade of medicinal cod liver oil in antirachitic potency and equal to good grades of cod liver oil in vitamin A.

Clinical studies to test the value of salmon oil in the treatment of rickets in infants were undertaken in New Haven, Conn., in the months of January, February and March, 1932. Samples of oil from three species of salmon were available for the tests. Two gallons of oil that had previously been prepared from the waste products of Humpback or Pink salmon [6] were obtained at the beginning of the study from a Western packing house, and later approximately 2½ quarts of oil were specially rendered from the canned waste products of two other species, the King or Chinook (a red salmon oil) and the Sockeye or Red.[7]

For the clinical test, cases of active rickets were sought during January, February and March among infants who had received no antirachitic treatment in the form of cod liver oil, viosterol or artificial ultraviolet ray therapy. No infant to be treated at home was included after the 14th of March. Three infants treated in the hospital were included later, two in March and one in April. No infant was considered suitable for the study if there was evidence by roentgenographic examination of fresh lime salt deposit in the rachitic metaphysis. Of the thirteen infants thus selected for the study, eleven had received no previous planned antirachitic treatment. One child (case 6) had been given a total of approximately 5 ounces (150 cc.) of cod liver oil at irregular intervals during the three months previous to the first examination, and one child (case 13) had received not more than one-half ounce (15 cc.) of cod liver oil approximately three weeks before his first examination. Since the roentgenograms in both of these cases showed severe rickets with no evidence of fresh lime salt deposit, the children were included in the test group.

Determinations of the serum calcium were made by the method of Kramer and Tisdall as modified by Clark and Collip,[8] and of the serum phosphorus by the Briggs modification of the Bell-Doisy method [9] in nine cases. At the first examination there was found

This study was undertaken as a result of a conversation with Dr. Lafayette B. Mendel regarding the need for a cheaper source of the antirachitic vitamin in the face of the present emergency food relief needs.

From the New Haven Rickets Studies of the U. S. Children's Bureau, the U. S. Bureau of Chemistry and Soils, the Department of Pediatrics, Yale University School of Medicine, and the Pediatric Service of New Haven Hospital and Dispensary.

1. Davis, D. E., and Beach, J. R.: Bull. 412, California Agricultural Experimental Station, 1926; The Antirachitic Value of Salmon Oil, Poultry Science **7**: 216, 1928.

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5. Holmes A. D., and Pigott, M. G.: Vitamin Potency of Cod Liver Oils: Vitamin Potency of Salmon Body Oil, Boston M. & S. J. **193**: 726 (Oct. 15) 1925. Truesdail, R. W., and Boynton, L. C.: Vitamin A Content of Body Oils of Pacific Coast Salmon, J. Indust. Engin. & Chem. **23**: 1136, 1931.

6. Mr. Harry R. Beard of the New England Fish Company, Vancouver, B. C., from whom the Humpback or Pink Salmon oil was obtained, reports that the waste products of the salmon were collected at random very largely from the refuse of the Pink or Humpback species, cooked for about thirty minutes in a steam-jacket cooker and treated with a certain amount of live steam. Including the process of pressing and that of allowing the oil to separate from the water, Mr. Beard estimates that "the oil was probably heated for about one to two hours at about 170 F." During the heating process the oil was exposed to the air.

7. Samples of oil from the Chinook and Sockeye species were prepared for this study by Dr. E. M. Nelson of the U. S. Bureau of Chemistry and Soils in January, 1932, from canned waste products obtained also through the courtesy of Mr. Harry R. Beard. The waste products had been canned in July, 1931, when fresh, and after evacuation of air for half an hour, heated to 240 degrees for three hours. The cans had been stored at a temperature of 10 degrees. The canned material was put into muslin bags and the oil and water expressed in a plant press. The greater portion of the oil separated out and the emulsion of oil and water was immediately separated by means of a centrifuge. The oil was then filtered through filter paper and washed several times with distilled water. On standing over night a small quantity of water separated out and the clear oil was decanted from it.

8. Clark, E. P., and Collip, J. B.: A Study of the Tisdall Method for Determination of Blood Serum Calcium with a Suggested Modification, J. Biol. Chem. **63**: 461 (March) 1925.

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Response to Treatment with Salmon Oil Shown in Thirteen Cases of Rickets.

Case	Name and Age	Clinical Data: Date	Craniotabes	Costochondral Junctions	Epiphyses at Wrist	Anterior Fontanel	Number of Teeth	Motor Development	Nutrition	Roentgenograms: Rickets	Roentgenograms: Osteoporosis	Blood Serum: Calcium, Mg. per 100 Cc.	Blood Serum: Inorganic Phosphorus, Mg. per 100 Cc.	Blood Serum: Protein, per Cent	Salmon Oil: Total Amount to Date, Ounces	Salmon Oil: Type	Feeding	Comment
1	N. R. Negro 9½ mo.	1/ 6	None	++	+++	4 cm.	0	Sits up unsteadily	Fair	Moderate, active +++	++	9.12	3.13	6.00	0	.....	Artificial feeding of skim milk or condensed milk since fourth day of life	Hypertrophic pyloric stenosis
		1/19	.....	.....	.....	.....	1	Sits up unsteadily		Very slight healing	++	11.25	4.84	6.69	4	Pink		Operation on twelfth day
		1/29	.....	.....	.....	.....	..	More active		Slight healing	++	11.20	5.27	....	7½	Pink		
		2/ 5	.....	.....	.....	.....	..	.....		Moderate healing	++	11.97	6.60	6.88	10	Pink	.....	In hospital with otitis media and diarrhea; salmon oil discontinued February 5 to 9
		2/12	.....	.....	.....	.....	..	.....		Marked healing	+	.....	....	....	11	Pink		
		2/25	None	++	+++	2 cm.	2	Sits up well; much stronger	Good	Marked healing	+	11.17	5.94	6.68	15	Pink	.....	Cold
		3/11	None	++	++	2 cm.	4	Pulls to standing		Very advanced healing	None	11.52	5.85	6.20	20	Pink		
2	E. P. Negro 7¼ mo.	1/29	None	+++	+	4 cm.	0	Cannot sit alone	Very good	Slight, active ++	+	8.64	5.79	6.98	0	.....	Breast fed 2 months; cow's milk	Mother works; patient is cared for indoors
		2/ 4	.....	.....	.....	.....	..	.....		Slight healing	+	.....	....	....	3	Pink		
		2/15	.....	.....	.....	.....	2	.....		Moderate healing	+	11.80	7.05	6.74	8	Pink		
		2/25	None	+++	+	4 cm.	2	Pulls to sitting position		Marked healing	None	12.01	6.90	7.56	12	Pink	Cereal, vegetable and egg	
		3/ 9	None	++	+	3 cm.	2	Sits up well but cannot yet stand		Complete healing	None	12.59	6.43	7.27	16½	Pink		
3	A. T. Negro 5½ mo.	1/27	+++	+++	+++	4 cm.	0	Cannot hold head steadily	Poor	Very marked, active ++++	++++	9.06	2.59	5.64	0	.....	Cow's milk formula	Seriously ill with infection of scalp, eczema, otitis media, cervical adenitis, anemia, fever; in hospital
		2/ 2	.....	.....	.....	.....	..	.....		.....	.....	8.86	1.85	6.13				
		2/ 6	.....	.....	.....	.....	..	.....		.....	.....	8.88	1.71	6.58	2½	Pink	Goat's milk	
		2/11	.....	.....	.....	.....	..	.....		No healing	++++	.....	....	....	3½	Pink		
		2/17	++	+++	+++	4 cm.	0	.....		Very slight healing	++++	10.07	3.13	6.74	6	Pink		
		2/24	+	+++	+++	4 cm.	0	.....		Slight healing	+++	9.62	3.55	5.54	9½	Chinook	.....	Infection improved; fever gone
		3/ 2	None	+++	+++	4 cm.	0	Holds head up well		Moderate healing	+++	9.95	4.08	5.78	14	Chinook	.....	Infection greatly improved
		3/ 9	.....	.....	.....	.....	..	.....		Moderate healing	+++	10.16	4.36	6.00	17½	Sockeye		
		3/16	None	+++	++	4 cm.	0	Kicks vigorously	Has gained weight	Marked healing	++	10.19	4.66	5.58	21	Sockeye	.....	Cervical glands still enlarged and hard; eczema greatly improved
		3/23	None	++	++	4 cm.	0	Cannot yet sit up		Advanced healing	+	10.07	5.52	5.45	25	Pink	Cow's milk	
4	J. N. Nordic 3½ mo.	4/ 6	++++	+++	++	4 cm.	0	Does not hold up head	Fair	Moderate, active +++	+++	7.74	3.31	5.25	0	.....	Cow's milk formula always	In hospital April 6 to May 2, pneumonia; oil begun April 7; oil discontinued April 9 to 10; otitis media; frontal and parietal bosses moderate
		4/15	+++	+++	++	4 cm.	0	.....		Very slight healing	+++	10.64	5.39	5.64	3½	Pink		
		4/23	?	+++	++	3 cm.	0	Holds up head; much more active		Moderate healing	++	11.30	7.10	6.04	8	Pink		
		5/ 2	None	++	++	3 cm.	0	.....		Marked healing	+	11.32	6.95	5.67	12	Pink		
5	L. P. Italian 6½ mo.	1/ 2	None	+	++	5 cm.	0	Not sitting up	Fair	Slight, active ++	++	.....	....	....	0	.....	Breast and cow's milk formula	Recovering from pneumonia
		1/19	None	?	++	5 cm.	0	Sits alone		Slight healing	++	.....	....	....	4	Pink		
		1/29	.....	.....	.....	.....	..	More active		Moderate healing	+	.....	....	....	8½	Pink		
		2/ 5	.....	.....	.....	.....	..	.....		Marked healing	None	.....	....	....	12	Pink		
		2/20	None	+	++	4 cm.	0	.....		Complete healing	None	.....	....	....	18½	Pink		
		3/ 7	None	0	?	4 cm.	0	Pulls to standing; active	Good	Normal bone	None	.....	....	....	24	Pink		
6	E. E. Negro 10½ mo.	1/ 9	None	+++	++++	3 cm.	2	Cannot stand	Very good	Very marked, active ++++	+++	.....	....	....	0	.....	Breast fed 8 months; then cow's milk and general diet	About 5 ounces of cod liver oil given irregularly during period from October 1 to January 1
		1/23	.....	.....	.....	.....	..	.....		Moderate healing	+++	.....	....	....	6	Pink		
		2/ 6	.....	.....	.....	.....	..	.....		Marked healing	+	.....	....	....	12	Pink		
		2/19	None	++	+++	2 cm.	3	Standing		Marked healing	None	.....	....	....	18	Pink		
		3/ 9	None	+	+++	2 cm.	3	Walking a few steps		Very advanced healing	None	.....	....	....	24	Pink		Moderate bowing of legs

Response to Treatment with Salmon Oil Shown in Thirteen Cases of Rickets—Continued

Response to Treatment with Salmon Oil Shown in Thirteen Cases of Rickets—Continued

Case	Name and Age	Date	Clinical Data: Craniotabes	Costochondral Junctions	Epiphyses at Wrist	Anterior Fontanel	Number of Teeth	Motor Development	Nutrition	Roentgenograms: Rickets	Roentgenograms: Osteoporosis	Blood Serum: Calcium, Mg. per 100 Cc.	Blood Serum: Inorganic Phosphorus, Mg. per 100 Cc.	Blood Serum: Protein, per Cent	Salmon Oil: Total Amount to Date, Ounces	Salmon Oil: Type	Feeding	Comment
7	J. H. Negro 3½ mo.	2/19 3/ 4 3/11	+++ ++ None	++ ++ ++	++ ++ ++	3 cm. 3 cm. 3 cm.	0 0 0	Holds up head More active	Fair	Very slight, active + Moderate healing Complete healing	+++ ++ ++	....	....	....	0 6 8	..... Pink Pink	Cow's milk formula	Wassermann reaction negative
8	I. M. Negro 4¼ mo.	2/12 2/26 3/ 4 3/11 3/18 4/ 1	+++ ++ + + + +	+++ +++ +++ +++ ++ ++	++ ++ ++ ++ ++ ++	4 cm. ..... 3 cm. 3 cm. 3 cm. 3 cm.	0 .. .. 1 2 2	Holds head up ..... More active ..... Tries to sit up	Very good	Moderate, active +++ Slight healing Moderate healing Moderate healing Moderate healing Marked healing	++ ++ ++ + None None	10.64 11.58 12.31 11.84 11.30	<1.5 4.47 5.94 4.60 6.79	5.88 6.11 6.37 6.20 6.24	0 7 9½ 12 15 18½ 24½	..... Chinook Chinook Chinook Sockeye Pink Pink	Breast fed supplemented with 2 bottle cow's milk formula	Parietal bosses Cold
9	L. M. Italian 5½ mo.	2/12 2/26 3/ 4 3/11 3/18	++ + None None None	+++ ++ ++ ++ ++	++ ++ ++ ++ ++	4 cm. 4 cm. 4 cm. 3 cm. 3 cm.	6 6 6 6 6	Cannot sit alone ..... Pulls to sitting position ..... Sits up	Good	Moderate, active +++ Very slight healing Slight healing Moderate healing Moderate healing	+++ +++ +++ ++ ++	....	....	....	0 5½ 9½ 11 12	..... Chinook Chinook Chinook Chinook	Breast entirely	
10	B. J. Negro 7 mo.	3/11 3/18 3/25 4/ 1 4/ 8	++++ +++ ++ + +	+++ +++ +++ +++ +++	+++ +++ ++ ++ ++	5 cm. 5 cm. 4 cm. 3.5 cm. 3 cm.	0 0 0 0 0	Sits. Does not pull to sitting ..... Sits up alone	Good Has gained weight 	Moderate, active +++ Slight healing Moderate healing Marked healing Advanced healing	+++ +++ None None None	8.76 10.33 10.92 ..... 12.00	3.54 6.01 6.17 .... 6.21	6.14 6.17 6.30 .... 6.51	0 5 9½ 14 16	..... Sockeye Sockeye Pink Pink	Breast fed 6 months; cow's milk, orange juice, cereal	Head rolling; Wassermann reaction negative Has been outdoors once for half an hour Has not been outdoors
11	W. M. Negro 5¼ mo.	3/11 3/18 3/25 4/ 1	+++ +++ ++ +	+++ +++ +++ +++	+++ +++ +++ ++	3 cm. 3 cm. 3 cm. 3 cm.	0 0 0 0	Makes no effort to sit up .... Pulls to sitting position	Very good 	Moderate, active +++ Very slight healing Slight healing Moderate healing	++ ++ + +	9.97 10.90 10.60	3.75 4.19 5.58	6.67 6.39 6.40	0 3 6 9	..... Sockeye Sockeye Sockeye	Breast and condensed	Wassermann reaction negative Outdoors once during past week but well wrapped up Has not been out this week
12	L. Ma. Negro 26½ mo.	3/14 3/23 3/30 4/ 6 4/13	None ..... None None None	+++ ..... +++ +++ +++	++++ ..... ++++ ++++ ++++	1 cm. ..... 1 cm. 1 cm. 0.5 cm.	18 18	Can just walk Unsteady and waddling gait More active ..... Walks better	Very good 	Very marked, active ++++ Slight healing Moderate healing Marked healing Very marked healing	++++ ++++ +++ ++ ++	8.39 9.81 10.25 11.70 9.74	3.50 4.01 5.65 7.81 5.52	6.50 6.83 6.16 6.93 6.79	0 4¼ 9½ 12 15	..... Sockeye Sockeye Sockeye Pink	Artificial feeding since second week of life; general diet now	Moderate knock-knees, pot belly, Harrison's groove; congenital syphilis; in hospital March 17 to April 14 Intravenous neoarsphenamine
13	T. H. Nordic 7¼ mo.	3/24 3/30 4/ 6 4/13 4/23	None None None None None	++++ ++++ ++++ +++ +++	+++ +++ +++ +++ ++	4 cm. 4 cm. 4 cm. 4 cm. 3.5 cm.	0 0 0 0 0	Holds up head; cannot sit up .... More active; sits up unsteadily	Very poor Fair 	Marked, active ++++ Very slight healing Slight healing Moderate healing Marked healing	++++ ++++ ++++ +++ ++	8.88 9.28 11.41 10.08 10.80	3.65* 4.10 5.60 6.70 5.50	6.95 6.75 7.01 .... 7.75	0 4 8 12 16	..... Sockeye Sockeye Pink Pink	Breast fed 2 months; goat's milk formula	One-half ounce cod liver oil three weeks previous to first examination; in hospital March 24 to April 23 Otitis media; double mastoiditis

* Blood slightly hemolyzed. Phosphorus determination probably a little high.

in each of the nine cases a low inorganic phosphorus or a low calcium, or both. Since a fluctuation of 1 per cent in serum protein brings about a change in the serum calcium of approximately 0.5 mg.,[10] determinations of serum protein have been made at each blood examination, the gross Kjeldahl technic being used.[11]

Clinically, seven children showed marked rickets, three moderate and three slight. Seven had craniotabes at the first examination, six of a moderate or marked degree, and one slight. In all thirteen cases a diagnosis of active rickets was made by roentgen ray.

Treatment with salmon oil was begun immediately after the first examination in doses comparable to those commonly used for cod liver oil (from 3 to 4 teaspoonfuls daily). In most of the cases 1 teaspoonful was given twice a day at first and increased to 2 teaspoonfuls twice a day after two or three days. Though this dose was not taken with absolute regularity, in a majority of the cases the total quantity consumed each week was very satisfactory. The quantity of oil dispensed weekly to each child was recorded and frequent observations were made to verify the statements of the mother with regard to the quantity given. Actually, from 2½ to 5 ounces (from 75 to 150 cc.) was taken weekly, indicating that the daily dose varied from 10 to 20 cc. The average daily dose was 13.8 cc., or approximately 3 ounces (90 cc.) a week. The oil was taken very well by all the children. Two or three of the mothers who had tried to give cod liver oil and failed reported that the children apparently liked the salmon oil. None of the children vomited the oil, and in no case was there a gastro-intestinal disturbance that could be attributed to it. (Two infants developed diarrhea associated with otitis media. The salmon oil was well tolerated both before and after the infection.)

Six infants received Pink salmon oil, one Sockeye and one Chinook throughout the test. In five cases the kind of oil was changed during the test but in no case before the end of the second or third week of treatment, so that in spite of the change the early antirachitic effect of each kind could be observed. The changes were made in four cases because the supply of Sockeye and Chinook oil was very limited and had to be supplemented with the Pink. In one case (patient 3, a child with severe secondary infection) Pink oil was given for three weeks and then Chinook oil was substituted on the ground that it probably contained more vitamin A than the Pink oil, a supposition later shown by biologic assay to be true.

Further examinations—clinical, roentgenographic and blood—were made at one or two week intervals throughout the period of treatment. The total amount and kind of salmon oil taken up to the date of each examination, the response to treatment as shown by clinical, roentgenographic or blood examinations, and other pertinent clinical data are given for the thirteen cases in the accompanying table.

Because of the limited supply of salmon oil, treatment with it was discontinued after the roentgenograms showed advanced healing or in a few cases when the blood calcium and inorganic phosphorus had reached a normal level. The period of observation was not more than nine weeks and not less than three in any case.

10. Peters, J. P., and Eiserson, Leo: The Influence of Protein and Inorganic Phosphorus on Serum Calcium, J. Biol. Chem. 84: 155, 1929.
11. Peters, J. P., and Van Slyke, D. D.: Quantitative Clinical Chemistry, Baltimore, Williams & Wilkins Company, vol. 2, p. 691.

RESPONSE TO TREATMENT

Roentgenographic Evidence.—Response to treatment as shown by the roentgenograms was very prompt in all cases but one. Of six children (patients 2, 4, 10, 11, 12 and 13) who were reexamined by roentgenogram after one week's treatment, all showed fresh deposits of lime salt on the sixth to the eighth day of treatment. Seven children (patients 1, 3, 5, 6, 7, 8 and 9) were not reexamined until the end of the second week (from thirteen to seventeen days after the oil was started); all but one showed fresh deposits of lime salt at this time. The one child (patient 3, a Negro baby, aged 5½ months, seriously ill with very marked rickets, eczema, a severe infection of the scalp, cervical adenitis and otitis media), though examined at the end of two weeks, showed no evidence of fresh lime salt deposit until the end of the third week. At this time a slight but definite change had taken place and was coincident with a general improvement in the child's condition. Of the six children whose roentgenograms showed the most prompt response to treatment, that is, by the seventh or eighth day, one (patient 2) had roentgenographic evidence of mild rickets, two (patients 4 and 11) of moderate rickets and three (patients 10, 12 and 13) of marked rickets. Five were between 3 and 7 months of age; one was 24 months old. It may be seen from the table that during this first week of treatment these children had taken amounts of salmon oil varying from 3 to 5 ounces (13 to 20 cc. per day).[12]

Once initiated, healing proceeded rapidly and was shown by roentgenogram to be complete or well advanced in eight children by the end of the period of observation, the length of time varying from three to nine weeks. Five children were still in the process of healing when the salmon oil was discontinued, but in every case the deposition of lime salt was proceeding satisfactorily. During the period of treatment, new centers of ossification appeared in the wrist or arm bones of five children; there was a definite increase in size and density of centers of ossification of six others.

Figures 1 to 3 show the roentgenograms of cases 12, 6 and 13 before and after treatment.

Changes in Blood Calcium and Phosphorus.—In the nine cases in which repeated blood examinations were made, it will be seen that the response to treatment was very prompt in all but one (case 3). In six cases (3, 4, 10, 11 12 and 13), blood examinations were repeated at the end of one week. In five of these the blood serum showed a definite increase in calcium or inorganic phosphorus or both after this first week's treatment, two reaching the normal level (calcium, from 9 to 12 mg.; phosphorus, from 4.5 to 6 mg.) within this time, and three by the end of the second week. In three cases the blood was not examined until after thirteen, fourteen and sixteen days of treatment (cases 1, 2 and 8) but the response was apparently equally good, since in each case the inorganic phosphorus or the calcium or both had reached the normal level at this time. Once reached, the normal level was consistently maintained. In case 3 (already discussed as showing a delayed response by roentgenographic evidence) the change in the blood calcium and phosphorus was delayed, owing in all probability to the severe

12. It should be noted in connection with these cases that three patients (4, 12 and 13) were in the hospital during the period of treatment and were not put outdoors or near an open window. Though the other three were treated at home, the weather was so stormy during the first two weeks of treatment for two (10 and 11) that each was taken outdoors only once. The third (2) never went out.

infection from which the child suffered. Not until the end of three weeks was there a definite improvement in either calcium or inorganic phosphorus. However, at the time when evidences of infection had become less toward the end of the first month, the calcium and phosphorus in the blood serum had also begun to rise. By the end of six weeks both calcium and inorganic phosphorus were normal. Such delay in response to antirachitic treatment due to infection has been recognized before.[13]

Of the eight children whose blood calcium and phosphorus had returned to normal at the end of the first or second weeks, three had received Pink oil, one Chinook and four Sockeye. One child (patient 1) showed very satisfactory improvement after taking only 3 ounces (90 cc.) of Pink oil over a period of two weeks. Others who had taken between 6 and 9 ounces (180 and 270 cc.) in the first two weeks showed even more striking improvement.

From the few cases studied, it is not possible to say whether response to treatment as shown by increase in blood calcium and phosphorus was more satisfactory with the oil from one species of salmon or from another.

In all cases in which blood and roentgenographic examinations were done at the same time, increase in

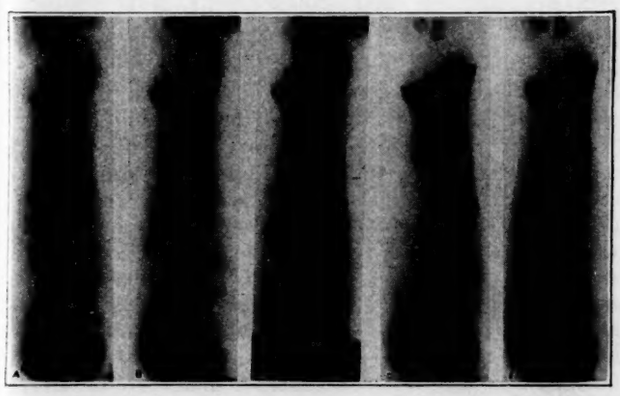


Fig. 1 (case 12).—Condition at 26½ months: *A*, before treatment; *B*, after one week's treatment with salmon oil (Sockeye); *C*, after two weeks; *D*, after three weeks; *E*, after four weeks.

the calcium and phosphorus in the blood serum and evidence of fresh lime salt deposit were observed simultaneously.

Clinical Evidence.—Disappearance of craniotabes, decrease in size of the anterior fontanel and improvement in the muscular condition are the best clinical evidences that an active case of rickets is undergoing prompt cure. The enlargement of costochondral junctions may not disappear until after the roentgenograms show that the disease is healed. Often the junctions appear firmer and may sometimes even seem to be larger during the early weeks of healing than before treatment was begun. Decrease in the enlargement of the epiphyses of the radius and ulna is also slow and cannot be relied on for judging the rapidity of cure in the early weeks of treatment.

Of the thirteen children treated with salmon oil, seven had craniotabes. A considerable improvement in the craniotabes was found in six children at the end of two weeks, and in all seven a marked improvement at the end of three weeks; in three cases (4, 7 and 9) it had disappeared altogether at the end of three weeks and in one case (3) at the end of five weeks. In one case (8), though improving markedly in three weeks, the craniotabes persisted in a small area in the right temporal bone until the seventh week. In two cases (10 and 11) the craniotabes improved greatly in two

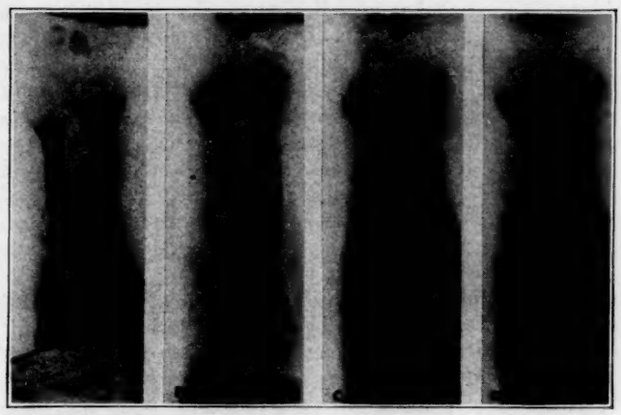


Fig. 2 (case 6).—Condition at 10½ months: *A*, before treatment; *B*, after two weeks' treatment with salmon oil (Pink); *C*, after four weeks; *D*, after six weeks.

weeks but was still present in a slight degree at the last observation after four and three weeks of treatment, respectively.

Relatively little change was observed in the size of the costochondral junctions or of the epiphyses of the radius and ulna during the period of treatment. The size of the anterior fontanel decreased in seven cases. In four cases, from one to four teeth erupted during the period of observation.

The muscular condition improved rapidly in all but two cases. Those children who were old enough to sit up or stand at the time of the first examination, but unable to do so, rapidly developed the ability to pull

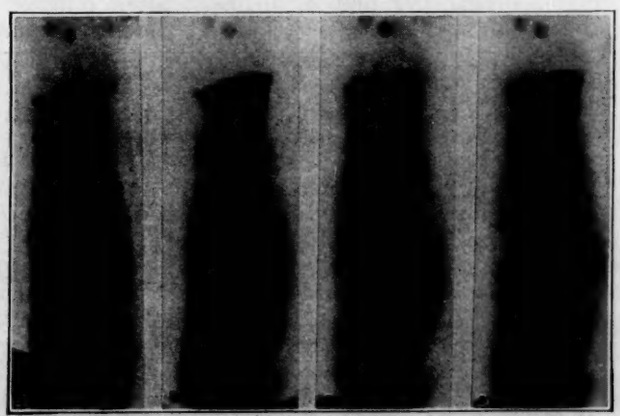


Fig. 3 (case 13).—Condition at 7 months: *A*, before treatment; *B*, after two weeks' treatment with salmon oil (Sockeye); *C*, after three weeks; *D*, after four weeks.

themselves to the sitting or standing position. Several of the mothers of children who were treated at home reported, often after only two or three weeks of treatment, that the children seemed stronger and more active.

COMMENT

That salmon oil is an antirachitic agent of considerable potency in the treatment of infantile rickets and

13. Wieland, Emil: Artificial and Indirect Heliotherapy in Rickets, Rev. franç. de pédiat. **4**: 735 (Dec.) 1928; Four Years of Indirect Heliotherapy and of Different Ergosterol Preparations in the Treatment of Rickets in the Basle Childs Clinic, Ztschr. f. Kindh. **47**: 643, 1929. Edelstein, E.: Rickets: Treatment with Small Doses of Viosterol, ibid. **48**: 481, 1929. Demant, Moritz: Vigantol Dosage, Deutsche med. Wchnschr. **55**: 1832-1833 (Nov. 1) 1929. Falkenheim, C.: Treatment of Infantile Rickets with Activated Ergosterol (Vigantol), ibid. **53**: 1550 (Sept. 9), 1927. Park, E. A.: Personal communication to the authors.

one that is well taken and well tolerated by infants in doses up to 20 cc. a day is clear from the foregoing discussion. To compare its efficacy with that of other antirachitic agents is difficult, since there is a considerable variation both in dosage and in potency of the agents used by different investigators, and frequently the exact amounts taken or the potency as compared with cod liver oil are not recorded. A review of the literature on the treatment of rickets brings out, moreover, the fact that relatively few studies give the results of the first and second weeks of treatment. This is particularly true of the investigations of the efficacy of cod liver oil, since the studies were made largely before the value of frequent and early blood and roentgenographic examinations was appreciated. It has, however, been shown by Park and Howland,[14] Howland and Kramer,[15] Tso,[16] Chick,[17] Garland,[18] Macrae [19] and others that evidence of response to treatment with cod liver oil should be obtained by roentgenographic examination in from fourteen to twenty-one days and by study of the calcium and phosphorus in the blood serum in at least two weeks. Park and Howland [14] found calcification to be complete at the end of two or three months. Chick [17] in from two to four months.

Investigators using direct irradiation with the mercury vapor quartz lamp report more rapid improvement. Hoag,[20] studying cases of tetany, found an improvement in the blood calcium after irradiation for from four to eight days and a return to the normal level in from thirteen to eighteen days. Tisdall,[21] Wyman and Weymuller [22] and Macchi [23] found that the blood phosphorus returned to the normal level after daily irradiation for from ten days to two weeks. Hess,[24] Carter-Braine,[25] Wyman and Weymuller,[22] and Macrae [19] report evidence of new calcification seen in the roentgenograms after from twelve to fourteen days' treatment.

More recently, investigators working with viosterol (irradiated ergosterol) report very rapid response to treatment with this antirachitic agent. Karelitz [26] found the earliest roentgenographic evidence of healing after twelve days of treatment; Vollmer,[27] after nine days; Aurnhammer and Kollmann,[28] after fourteen days; Aidin,[29] after three weeks, and Hess,[30] "within a fortnight." Restoration of the blood calcium and phosphorus to the normal level is reported by Karelitz [26] to have occurred in from twelve to fourteen days after treatment with an irradiaated ergosterol preparation was begun, by Edelstein [31] in from ten to twenty-three days, by Beumer and Falkenheim [32] in ten days, by Catel [33] in from thirteen to sixteen days, by Macrae [19] in one week and by Hess [30] in from nine to thirteen days. With irradiated milk similar but less striking results have been obtained. Bratusch-Marrain [34] found the earliest evidence of fresh calcification in roentgenograms after the administration of irradiated milk for from one and one half to two weeks, and Kramer [35] after three weeks. György [36] reports increase in blood calcium and phosphorus after one month's treatment; Kramer [35] after from ten days to four weeks.

Though an exact comparison of the efficacy of salmon oil with the efficacy of these other antirachitic agents cannot be made, in general it may be said that the salmon oil used in the present study is probably a more potent antirachitic agent than average cod liver oil and compares very favorably in the rapidity of its action with viosterol. Consideration must be given to the fact that exact data with respect to the relative doses of vitamin D administered in cod liver oil and in viosterol are not available, and that when vitamin D has been administered in the form of viosterol very large doses have been possible. Like cod liver oil, salmon oil has the advantage over viosterol of containing vitamin A as well as vitamin D and of providing also an apparently easily digested fat.

Given in doses of from 10 to 20 cc. daily, salmon oil has been shown to bring about fresh calcification of the rachitic metaphysis demonstrable in roentgenograms taken at the end of one week of treatment, and to raise the calcium and phosphorus in the blood serum a significant amount (in two cases to normal) in the same period of time. By the end of two weeks of treatment, the deposition of lime salt was considerably increased and the blood calcium and phosphorus had reached a normal level. In cases of moderate or severe rickets, calcification of the metaphysis was very advanced at the end of from five to nine weeks, in mild rickets after from three to five weeks.

BIOLOGIC ASSAY

In order to determine more exactly the vitamin A and vitamin D potency of the samples of salmon oil used in this study, biologic assays have been made by the Bureau of Chemistry and Soils of the U. S. Department of Agriculture.

The vitamin A potency of the salmon oil was determined by the following procedure: Five litters of rats (seven animals in a litter) were fed a vitamin A deficient ration until definite symptoms of vitamin A deficiency were evident. The A-deficient ration had the following composition: casein, alcoholic extract, 18 parts; Osborne and Mendel's Salt IV,[37] 4 parts; agar, 2 parts; yeast, 7 parts; dextrinized cornstarch, 67 parts; peanut oil, 1 part. One sixteenth of the yeast

14. Park, E. A., and Howland, John: The Radiographic Evidence of the Influence of Cod Liver Oil in Rickets, Bull. Johns Hopkins Hosp. **32**: 341-344 (Nov.) 1921.
15. Howland, John, and Kramer, Benjamin: Calcium and Phosphorus in the Serum in Relation to Rickets, Am. J. Dis. Child. **22**: 105 (Aug.) 1921.
16. Tso, E.: Incidence of Rickets in Pekin: Efficacy of Treatment with Cod Liver Oil, China M. J. **38**: 112 (Feb.) 1924.
17. Chick, Harriette; Dalyell, E. J.; Hume, E. M.; MacKay, H. M. M; Smith, H. H., and Wimberger, H.: Studies of Rickets in Vienna, 1921-1922: Part II. Observations upon the Prophylaxis and Cure of Rickets at the University Kinderklinik, Vienna, Report of British Medical Research Council, 1923, p. 74.
18. Garland, J.: The Importance of Cod Liver Oil as an Antirachitic Agent, Boston M. & S. J. **191**: 347 (Aug. 21) 1924.
19. Macrae, Olive: The Value of Different Therapeutic Agents in the Treatment of Rickets, Arch. Dis. Childhood **5**: 431 (Dec.) 1930.
20. Hoag, Lynne A.: The Treatment of Infantile Tetany with Ultraviolet Radiations, Am. J. Dis. Child. **26**: 186 (Aug.) 1923.
21. Tisdall, F. F.: The Effects of Ultraviolet Rays on Calcium and Inorganic Phosphate: Content of the Blood Serum of Rachitic Infants, Canad. M. A. J. **12**: 536 (Aug.) 1922.
22. Wyman, E. T., and Weymuller, C. A.: The Organization of a Special Clinic for the Treatment of Rickets with the Mercury Vapor Quartz Lamp, J. A. M. A. **83**: 1479 (Nov. 8) 1924.
23. Macchi, A.: Effect of Ultraviolet Rays and of Irradiated Ergosterol on Rickets, Pediatria **37**: 1175-1190 (Nov. 1) 1929.
24. Hess, Alfred: Rickets, Osteomalacia and Tetany, p. 425.
25. Carter-Braine, J. F., and Osman, A. A.: The Treatment of Active Rickets by the Mercury Vapour Lamp, Guy's Hosp. Rep. **75**: 491 (Oct.) 1925.
26. Karelitz, Samuel: Activated Ergosterol in the Treatment of Rickets, Am. J. Dis. Child. **36**: 1108 (Dec.) 1928.
27. Vollmer, H.: Contribution to the Ergosterol Treatment of Rickets, Monatschr. f. Kinderh. **38**: 70 (Jan.-Feb.) 1928.
28. Aurnhammer, A., and Kollmann, A.: Treatment with Irradiated Ergosterol for Rickets, Arch. f. Kinderh. **87**: 138 (May 31) 1929.
29. Aidin, R.: Irradiated Ergosterol in the Treatment of Rickets, Lancet **1**: 229 (Feb. 4) 1928.
30. Hess, Alfred: Rickets, Osteomalacia and Tetany, pp. 419-420.
31. Edelstein, E.: Rickets: Treatment with Small Doses of Viosterol, Ztschr. f. Kinderh. **48**: 481, 1929.
32. Beumer, H., and Falkenheim, C.: Ergosterol and Its Antirachitic Action in Infants, Klin. Wchnschr. **6**: 798 (April 23) 1927.
33. Catel, W.: The Dosage of Irradiated Ergosterol, Monatschr. f. Kinderh. **45**: 97 (Oct.) 1929.
34. Bratusch-Marrain, Alois, and Siegl, Josef: Irradiated Milk in the Treatment of Rickets, Arch. f. Kinderh. **89**: 201 (Jan. 17) 1930.
35. Kramer, Benjamin: Rickets in Infants; Treatment with Irradiated Milk, Am. J. Dis. Child. **30**: 195 (Aug.) 1925.
36. György, P.: Irradiated Milk in the Therapy of Rickets, Jahrb. f. Kinderh. **111**: 201 (Jan.) 1926.
37. Osborne, T. B., and Mendel, L. B.: J. Biol. Chem. **32**: 374 (Dec.) 1917.

had been irradiated with ultraviolet rays and its vitamin D potency determined. The vitamin A storage of these animals had been controlled by limiting as far as possible the source of vitamin A in their mother's milk.[38] In from twenty-two to twenty-six days from the time they were fed the A-deficient ration only, the animals developed very apparent ophthalmia. Some of the animals had ceased growing and a few had lost weight, but in no case exceeding 5 Gm. Five animals were discarded and the remainder were divided into five groups, so that there were three males and three females of approximately the same size in each group. One group received no vitamin A and served as a negative control. The other groups received, respectively, the following daily feeding of oil: 10 mg. of cod liver oil, 10 mg. of Sockeye salmon oil, 10 mg. of Chinook salmon oil, and 20 mg. of Pink or Humpback salmon oil. The cod liver oil used was a composite sample made up of nineteen samples of medicinal cod liver oils that had recently been collected in a survey by the Food and Drug Administration. The composite should therefore be a fair representation of the medicinal cod liver oils on the market. The oil feeding extended over a period of twenty-eight days. The growth responses of the animals are shown in figure 4. It is apparent from these results that the Sockeye and Chinook salmon oils used in these investigations were nearly equal to cod liver oil in vitamin A, and both were definitely superior to Pink salmon oil. The greatest improvement in the eye condition was in the cod liver oil group, in which some inflammation of the lids persisted in only three of the animals at the termination of the experiment. All the animals in the Sockeye and Chinook groups showed some redness of the lids at the end of four weeks, but in all cases there was some alleviation of ophthalmia. In the Pink salmon oil group the condition was in general slightly more severe at the termination than at the beginning of the oil feeding.

Vitamin D was determined according to a procedure described recently.[39] It consists essentially of determining the quantity of material being tested that must be added to the ration to produce the same rate of healing of induced rickets in rats as 0.1 per cent of a "standard" cod liver oil. The salmon oils were compared with the composite sample of cod liver oil used for comparison in the vitamin A tests. Five-hundredths of one per cent of each of the salmon oils was first compared with 0.1 per cent of the cod liver oil in their ability to promote healing of induced rickets. The Sockeye and Pink oils and cod liver oil all produced regularly wide bands of calcification at these levels, but with Chinook oil, while there was evidence of healing a continuous line was not produced. By increasing the level of Chinook oil to 0.075 per cent of the ration, approximately the same degree of healing was obtained as with 0.1 per cent of cod liver oil. Therefore, the sample of Chinook salmon oil used in this study was approximately 50 per cent more potent in vitamin D than cod liver oil, and the samples of Sockeye and Pink salmon oils approximately twice as potent as cod liver oil. It should be remembered that previous assays of other samples of Chinook oil [4] showed it also to be twice as potent as cod liver oil.

38. Nelson, E. M.: Science **68**: 212 (Aug. 31) 1928.
39. Nelson, E. M., and Walker, Reed: Vitamin Content of Medicinal Cod Liver Oils and Related Products, J. A. M. A. **98**: 1263-1265 (April 9) 1932.

POTENTIAL SUPPLY OF SALMON OIL

The total catch of salmon in 1929 in the Pacific states and Alaska is reported by Fiedler [40] of the U. S. Bureau of Fisheries to have been over 500,000,000 pounds. Of this, approximately 28 per cent was Sockeye or Red salmon, 9 per cent Chinook or King, 38 per cent Humpback or Pink, and the remainder, 25 per cent, Chum and Silver. Tolle and Nelson [4] estimate that the waste from the canning process would yield, potentially, 1,000,000 gallons of salmon oil annually. Of this, approximately 370,000 gallons would come from the Sockeye and Chinook species of salmon, which are known to be nearly as potent in vitamin A and twice as potent in vitamin D as cod liver oil, and 380,000 gallons from the Pink or Humpback salmon, which is probably considerably lower in vitamin A potency than cod liver oil but, like the oil from Sockeye and Chinook salmon, is twice as potent as cod liver oil in vitamin D. Greater care in the preparation of the Pink salmon oil may ultimately prove it to contain more vitamin A than has been demonstrable with present samples.

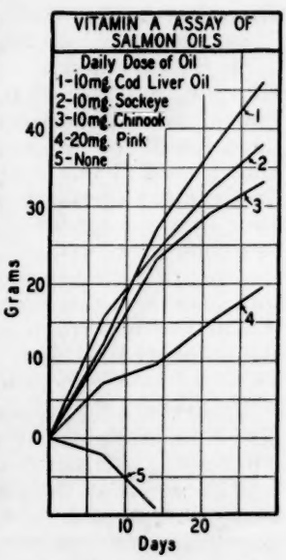


Fig. 4.—Growth curves showing that Sockeye and Chinook salmon oils are nearly equal to the average medicinal cod liver oil in vitamin A potency and that Pink salmon oil is much inferior in this respect. The curves show the average weight changes of six animals in each group over a test period of twenty-eight days. The growth curves during this period of depletion in vitamin A are not shown. The loss in weight of the animals in the negative control group shows that the animals had been depleted of vitamin A before the test was begun.

If such a quantity of salmon oil, a source of vitamin D as yet untapped for human consumption, were to be put on the market as a properly standardized food and supplied at low cost to the public through the usual channels for the distribution of food, one of the great nutritional needs of infants and young children could be more easily, and therefore more adequately, met.

SUMMARY

Thirteen children with active rickets have been treated with salmon oil, and the response to treatment, as shown by clinical examinations, roentgenograms and determinations of blood calcium and phosphorus, has been recorded at intervals of one or two weeks. Oil was used which had been prepared from the waste products of three species of salmon, the Pink or Humpback, the Chinook or King, and the Sockeye or Red.

The oil was given in doses of from 10 to 20 cc. a day, the average amount being 13.8 cc. It was well taken and well tolerated by all thirteen children.

Response to treatment as shown by roentgenographic and blood studies was very prompt, and advanced healing was brought about in from three to nine weeks.

Of the six children whose blood was studied after from six to eight days of treatment, five showed definite increase in the serum calcium or serum phosphorus or both; two reached the normal level by the end of the first week, three by the end of the second week. Three children who were reexamined for the first time after

40. Fiedler, R. H.: Doc. U. S. Bureau of Fisheries, 1930, Fishery Industries of the United States, p. 139.

two weeks' treatment showed a return in serum calcium and phosphorus to the normal level. Only one child showed a greater delay in response to treatment.

Roentgenographic evidence of response to treatment was equally prompt, seven children showing the fresh lime salt deposits in one week, and five others in two weeks. One child did not show fresh deposits until the end of three weeks.

Craniotabes improved rapidly under treatment with salmon oil.

Biologic assays for vitamin A and D were made of the three samples of salmon oil used. They showed that the Sockeye and Chinook oils were nearly equal in vitamin A potency to a composite sample made from nineteen medicinal cod liver oils, and that Pink oil was distinctly inferior in vitamin A potency. The Sockeye and Pink oils contained twice as much vitamin D as the cod liver oil composite, and the Chinook oil about 50 per cent more than the same sample of cod liver oil.

There is a potential supply of 1,000,000 gallons of salmon oil available through the salmon canning industries of the Pacific states and Alaska. Approximately three fourths of this would come from the species of salmon used in this study and shown to be potent in the treatment of rickets. About 370,000 gallons would come from the species of red salmon known to be high in vitamin A as well as vitamin D. The production at low cost of such a quantity of salmon oil would be of special value at this time, when the nutrition of many infants and children is suffering from lack of proper and adequate food.

CONCLUSION

Though exact comparison of the efficacy of salmon oil in the treatment of infantile rickets with that of other antirachitic agents cannot be made, it may in general be said that the salmon oil used in the present study was probably a more potent antirachitic agent than the average cod liver oil and compared very favorably in the rapidity of its action with viosterol. Like cod liver oil, salmon oil, especially that from the more highly colored species, has the advantage of providing vitamin A in addition to vitamin D. It also provides an apparently easily digested fat, and from the limited experience of this investigation would seem to be well taken and well tolerated.

330 Cedar Street.

The Human Element in Medicine.—While it is necessary for the physician and surgeon today to exert himself for the best in science, it also is vital that he shall not lose the human touch which gave the old country doctor his priceless worth. We surgeons should not allow our patients to become merely cases. Ministering to the physical needs of humanity demands more than the wielding of the scalpel and the prescribing of drugs. There should be a bond between the physician and the sufferer that cannot be diagrammed. His heart must reach out with pity and understanding to the afflicted. Unless this is so, the faith, hope and trust which are necessary to the successful practice of medicine and surgery will be lacking. Accurate diagnosis and scientific treatment are important, but the human element is equally essential. Neither can stand on its own feet unaided and be true to the standards set up by our profession. We, today, are threatened with becoming medical robots, coldly scientific, highly skilled, but without hearts. I feel that each of us, when the time comes to face the surgeon's knife, wants more than just a skilled operator. We would like to feel that the man performing the operation cares a little bit about our personal welfare. It is true that we cannot allow sympathy to impair technic or efficiency. We must not brood over failures, but must learn from them without losing courage.—Chaffee, B.: The Importance of the Human Element in Medicine, *Am. J. Surg.* **17**:448 (Sept.) 1932.

THE ANTITOXIN TREATMENT OF ERYSIPELAS

FURTHER OBSERVATIONS

DOUGLAS SYMMERS, M.D.
Director, Division of Laboratories, Department of Hospitals
AND
KENNETH M. LEWIS, M.D.
Assistant Visiting Surgeon, Bellevue Hospital
NEW YORK

For the past five years the use of antitoxin has been a routine measure in the treatment of erysipelas at Bellevue Hospital. During this period, 3,311 patients have been treated. Of this number, 1,944 were men, 1,047 were women, and 320 were children.

There is one point that we wish to emphasize at the outset, namely, that the possible value of the antitoxin over other methods of treatment was approached with an open mind. One of us (Lewis) had the opportunity of treating erysipelas at Bellevue Hospital with a great many local remedies for a period of five years before the antitoxin of erysipelas was introduced. The results with the older methods were uniformly unsatisfactory. No matter what local remedies were used, there was no change in any way in the course of the disease. With the use of antitoxin, however, we began to obtain results that could not fail to impress us. Patients with a full blown rash and a temperature of 104 or 105 would show a fading rash and normal temperature in from one to three days, and even in some of the cases that did not, we noted a marked diminution in the toxemia of the disease. Criticism was offered of a preliminary report [1] on 131 patients made in 1927 on the basis that the severity of erysipelas varies from year to year, and the thought was expressed that possibly the year on which we were reporting was a so-called mild year. This was justifiable criticism. An answer was attempted a year later by a report of two consecutive years with identical results.[2] We have now completed five full years with this method of treatment, and the basic figures and clinical observations remain exactly the same. We feel that this should certainly be considered a long enough period to obviate the criticism of seasonal variation as a factor in altering the results.

The antitoxin that we use is prepared by immunizing horses with several strains (eight) of the streptococcus of erysipelas.

We always administer the antitoxin intramuscularly and never intravenously, since early in our experience the intravenous route was used with results which, in several cases, were alarming and, in one case, fatal. Our routine is to administer 10 cc. of the concentrated antitoxin intramuscularly as soon as the patient is seen, and thereafter another dose of 10 cc. is given every twelve to twenty-four hours, depending on the severity of the disease, until the desired effect is obtained. If, after six injections, no improvement is evident, we discontinue the use of the antitoxin. We use the same

From the Erysipelas Service of Bellevue Hospital.
Read before the Annual Meeting of the Medical Society of the State of New York, Buffalo, May 24, 1932.

1. Symmers, Douglas, and Lewis, K. M.: Antitoxin Treatment of Erysipelas, J. A. M. A. **89**: 880 (Sept. 10) 1927.
2. Symmers, Douglas: Antitoxin Treatment of Erysipelas, J. A. M. A. **91**: 535 (Aug. 25) 1928.

dosage and frequency of injection in children as in adults.

There are two important points that should be stressed in this method of treatment. First, the antitoxin should be given as soon as the diagnosis is made, and it should be repeated every twelve to twenty-four hours for six doses, unless a definite result is obtained in the meantime. As in every disease in which an antitoxin is of value, the earlier treatment is started, the better are the results. We have noted a number of failures in which it was felt that delay in initiating treatment was the cause. The patients in such instances, we assume, are so saturated with toxin that, no matter how much antitoxin is given, it is impossible to counteract the effects of the provocative agent.

Second, the intramuscular route should always be used. We have had several severe reactions from intravenous administration and we see no need for employing it, since the intramuscular route is entirely satisfactory.

Of the two main types of erysipelas, namely, the facial and the body, the facial type is the more amenable to treatment. The body type is more severe and more intractable, and the mortality from it is correspondingly higher.

We would like to say a word concerning local treatment in this disease. Erysipelas is a constitutional disease and the body rash is merely an objective phase, so that local applications are useless as measures of control. The only value of dressings is to increase the comfort of the patient. For this we use boric acid or other simple solutions, and these are discontinued if they annoy the patient.

One might ask why the antitoxin does not yield a cure in all cases. We think the first and most important reason is the fact that the micro-organism which causes erysipelas is a streptococcus and, like all streptococci, is of many strains. If one has a patient with erysipelas in whom the offending micro-organism happens to be of a strain not contained in the antitoxin, it is evident that the result in that particular patient is not apt to be satisfactory. This is seen in other diseases caused by specific micro-organisms, as, for example, in meningococcus meningitis, when one patient may show definite results from the use of antimeningococcus serum while the next may not exhibit any improvement. The antitoxin of erysipelas is being improved in this respect by the addition of strains of the streptococci isolated from resistant patients.

Delay in administering the antitoxin at the onset of the disease and failure to repeat the dose at frequent intervals are two additional reasons for not obtaining good results. It is not unusual to see a case in which two or three days has elapsed before treatment has been instituted and in which, even when the treatment has once been started, injection of the antitoxin is delayed from day to day.

Other factors that affect the result are the age and general condition of the patient. In infants and young children, erysipelas is an extremely serious disease, and the mortality is proportionately higher than in adults. Likewise, the aged frequently show low resistance. The alcoholic, the debauched and the debilitated are individuals whose resistance is low and in them the disease is of more serious moment than in the vigorous and the temperate.

Recognizing these factors, we have found that there are about five out of every hundred patients in whom the antitoxin is of no value. These patients show no benefit from the treatment and should probably be grouped in the class whose infection is caused by a strain of the micro-organism not used in the preparation of the antitoxin. As stated before, when additional strains are isolated and used in the preparation of the antitoxin, the resistant patients will probably come under control.

No immunity is rendered by this method of treatment. Patients subject to recurrent attacks of erysipelas are not relieved from the likelihood of further attacks. Nor are the complications lessened.

From 1904 to 1926, a period of twenty-three years, 15,277 cases of erysipelas were treated at Bellevue Hospital without antitoxin. There were 1,543 deaths, an average mortality of 10.1 per cent.

Comparative Mortality Statistics, With Antitoxin and Without Antitoxin

	Number of Patients	Deaths	Mortality Rate, per Cent
With antitoxin:			
May, 1927, to May, 1932..	3,311	237	7.1
Without antitoxin:			
1904 to 1927.....	15,277	1,543	10.1

From May 1, 1927, to May 1, 1932, a period of five years, the present series of 3,311 patients were treated in the same service, but this time with the routine use of antitoxin. There were 237 deaths, an average mortality of 7.1 per cent, or a reduction of 30 per cent in the number of deaths. In the series of 3,311 cases it means the saving of 100 lives.

In comparing the duration of the disease before and after this method of treatment was started, it was found that from 1926 to 1927, when no antitoxin was used, 489 cases of facial erysipelas gave the following figures: 26.7 per cent were cured in 3 to 7 days; 49.2 per cent in 8 to 14 days; 15.1 per cent in 15 to 53 days; while from 1927 to 1928, when antitoxin was used, of 563 cases, 92.1 per cent were cured in 2 to 7 days. Of 92 body cases, treated without antitoxin, 18.4 per cent were cured in 4 to 7 days; 42.3 per cent in 8 to 14 days; 16.3 per cent in 15 to 46 days. Of 142 body cases treated a year later with antitoxin, 78.1 per cent were cured in 3 to 7 days and 9.8 per cent in 8 to 14 days. There was thus an average reduction in the duration of the disease of 59.6 per cent, or approximately 60 per cent.

CONCLUSIONS

1. The antitoxin treatment of erysipelas marks a definite advance in overcoming the disease. It is of value, however, only in controlling the immediate process and does not prevent additional attacks.

2. The average duration of the disease is reduced about 60 per cent.

3. The number of deaths in more than 3,300 patients was reduced 30 per cent.

4. About five out of every hundred patients are resistant to this method of treatment. This is probably due to the fact that the causative micro-organism is one of many strains.

140 East Twenty-Eighth Street—59 East Fifty-Fourth Street.

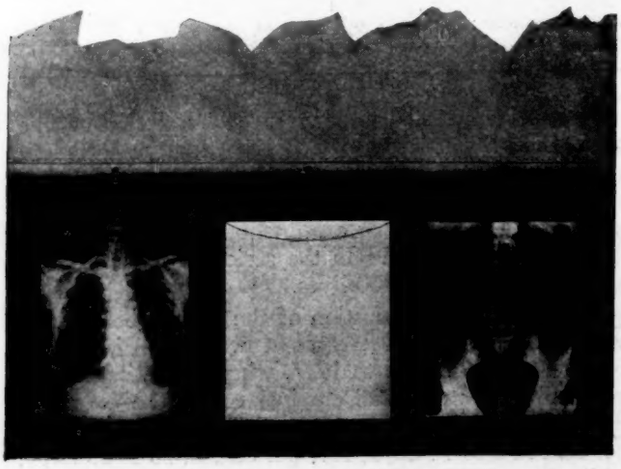
Clinical Notes, Suggestions and New Instruments

SHADE-VIEW FOR X-RAY FILMS

EDGAR G. BALLENGER, M.D.; OMAR F. ELDER, M.D., AND HAROLD P. MCDONALD, M.D., ATLANTA, GA.

Is the present method of viewing roentgenograms providing the maximum information and benefit from x-ray films? It is our opinion that it is not. Repeated study will frequently permit the observation of unexpected points which are not at first noted. One usually sees what one is looking for and often fails to see what one does not suspect. Especially is this true if the questions brought out by the history and physical examination seem answered by routine study of the films.

For many years we have made it a practice, after the usual study in a view-box, to place films in a convenient window in order to look them over from time to time as occasion presents itself. While this plan has afforded certain advantages, we have not been able to find a satisfactory method of display. The films become wet, soiled or otherwise damaged, or perhaps misplaced. Finally we adopted the plan of placing the films in a window-shade attachment. The satisfaction and ease with which it has been used leads us to describe this attachment. It is merely a section of black window-shade with thin, clear celluloid pockets into which the films are placed. A wooden lath, like



Shade-view attached to shade. The empty middle section shows celluloid pocket, into which films are readily placed.

that in the bottom of the standard shade, is placed at the top and bottom of the film view section. Two holes are provided for small bolts to attach it to the lower part of the shade.

At first, openings were cut out of the window-shade itself and the double layer of celluloid sewed over the opening. Difficulty was experienced, however, in sewing on such a large piece as the shade. Later we arranged to have the sections made separately. The sections used in our offices hold three 15 by 17 inch films. If needed, a second, or even a third, section may be attached to the same shade. While in some respects details of films so shown are not as well brought out as in a view-box, the shade-view affords certain advantages which more than counterbalance this minor disadvantage.

In times of business depression, the average patient does not wish to incur the expense of roentgenograms if it can be avoided. Old films properly selected are often of value in explaining to such a patient the probable cause of his symptoms and why roentgenologic studies should be made. Moreover, the intelligent layman of today is rightly curious about the details of his condition. He feels that, since he has paid for having the x-ray pictures made, he has a right to see them and to have them explained to him. Time spent in such explanation will not only please him but also do a great deal toward securing his more intelligent cooperation in the course of treatment recommended.

804 Healey Building.

A SIMPLIFIED GUIDE FOR THE PASSAGE OF ESOPHAGEAL DILATORS

PERCY B. DAVIDSON, M.D., BOSTON
AND
FERNANDO BIGURIA, M.D., GUATEMALA

The necessity of using a guide for the passage of esophageal dilators, when dilation is done by so-called blind bouginage (i. e., without direct visualization through the esophagoscope) has been recognized. Plummer and Mixter have advised the swallowing of many feet of thread in the hope that this will have passed the obstruction and become entwined in the intestine; the thread held taut may then be used as a guide by inserting it into a suitable opening in the tip of the dilating instrument. In spite of the physician's most painstaking instructions and the cooperation of an intelligent patient, this often fails to pass the obstruction or becomes knotted and is thus useless for the passing of the instrument. Such difficulties are found more particularly in cardiospasm, in which the thread becomes enmeshed in the sac oral to the obstruction.

Fig. 1. — Plummer hydrostatic dilator threaded on the wire, the dilating portion of the apparatus being in the region of esophageal obstruction.

It is well known that the old-fashioned stomach tube (Ewald type) may, particularly with fluoroscopic control, be introduced into the stomach in so-called spastic conditions of the esophagus. It occurred to us that the channel within such a tube introduced into the stomach could be used for the passage of a wire guide.

THE METHOD

1. After preliminary lavage of the cardiospasm sac with warm water, a large stomach tube (28 French) is passed into the stomach with fluoroscopic aid; this serves, first, to assure the operator that a tube of this bore can pass, and, secondly, to give a small dilatation; this tube is then withdrawn.

2. A piano wire sufficiently small to pass through the thread lumen of Plummer dilators, 72 inches in length, at one end of which is attached a metal tip of the Rehfuss type (covered with a thin layer of paraffin), is pulled through a piece of rubber catheter tubing (28 French) 26 inches long, the interior of which is lubricated with liquid petrolatum. With fluoroscopic aid, this tube containing the wire is passed into the stomach.

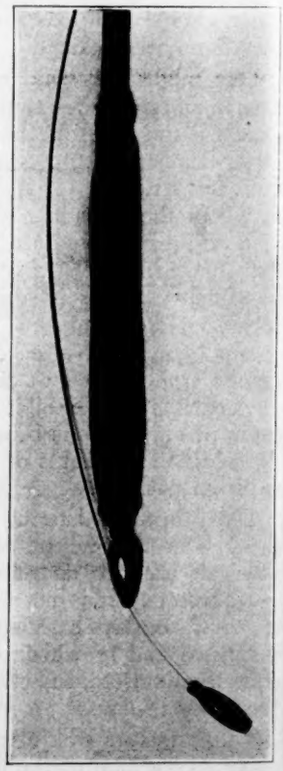


Fig. 2.—Wire guide threaded with Plummer hydrostatic cardiospasm dilator.

From the Gastro-Intestinal Clinic, the Boston City Hospital, and the Department of Medicine, Tufts College Medical School.

3. The rubber tube sheath is removed, leaving the metal tip in the stomach and the wire in the esophagus.

4. The proper type of dilator (bougie or hydrostatic bag) may then be passed on the wire guide.

This method has been found to be very satisfactory in the treatment of cardiospasm. It eliminates delay for the patient and the operator, and discouragement to the already fatigued and malnourished patient through repeated ineffectual attempts to get the thread anchored in the intestine. At first glance, one might think that the introduction of a wire might be dangerous; it is held loosely in its path and is certainly less cutting than a thread held taut; the blunt Rehfuss tip is, we feel, harmless when its passage is viewed fluoroscopically. More than fifty dilations of cardiospasm have been done by this method. No untoward results have occurred in any case. In many cases in which repeated attempts to pass the thread guide failed, the wire guide passed readily. The desirability of preliminary esophageal lavage cannot be overemphasized.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

W. A. PUCKNER, Secretary.

DIAL-CIBA (See New and Nonofficial Remedies, 1932, p. 83).

The following dosage forms have been accepted:

Solution Dial-Ciba with Urethane, Sterile Ampules, 1.1 cc.: Each cubic centimeter contains Dial-Ciba 0.1 Gm. (1½ grains), ethyl carbamate (urethane) 0.4 Gm. (6 grains), monoethylurea 0.4 Gm. (6 grains) and water q. s.

Actions and Uses.—The same as those of Dial-Ciba; it is claimed that the ethyl carbamate and monoethylurea are used as solvents, and, in the amounts present, do not greatly affect the action of the Dial-Ciba content. Solution Dial-Ciba with Urethane is proposed for intramuscular administration and, only when pressing emergency exists, for intravenous injection.

Solution Dial-Ciba with Urethane, Sterile Ampules, 2.3 cc.: Each cubic centimeter contains Dial Ciba 0.1 Gm. (1½ grains), ethyl carbamate (urethane) 0.4 Gm. (6 grains), monoethylurea 0.4 Gm. (6 grains) and water q. s.

Actions and Uses.—The same as those of Dial-Ciba; it is claimed that the ethyl carbamate and monoethylurea are used as solvents, and, in the amounts present, do not greatly affect the action of the Dial-Ciba content. Solution Dial-Ciba with Urethane is proposed for intramuscular administration and, only when pressing emergency exists, for intravenous injection.

CHINIOFON-SEARLE (See New and Nonofficial Remedies, 1932, p. 125).

The following dosage form has been accepted:

Tablets Chiniofon-Searle Enteric Coated, 0.25 Gm. (4 grains): The tablets are coated with phenyl salicylate.

TYPHOID VACCINE (See New and Nonofficial Remedies, 1932, p. 388).

E. R. Squibb & Sons, New York.

Typhoid Vaccine (Immunizing).—(See New and Nonofficial Remedies, 1932, p. 392). Also marketed in packages of one 5 cc. vial containing 1,000 million killed typhoid bacilli per cubic centimeter; and in packages of one 20 cc. vial containing 1,000 million killed typhoid bacilli per cubic centimeter.

ANAEROBIC ANTITOXIN (See New and Nonofficial Remedies, 1932, p. 359).

The National Drug Co., Philadelphia.

Tetanus-Perfringens Antitoxin.—An antitoxic serum prepared by immunizing horses individually against the toxins of B. tetani and B. perfringens (B. welchii). After the desired degree of potency is obtained, the horses are bled, the plasma separated and the serum prepared in a manner similar to that used for other antitoxic serums. The product is concentrated by a method which is similar to that used in concentrating diphtheria or tetanus antitoxin. The unit value of both tetanus and perfringens antitoxin is determined according to the method prescribed by the National Institute of Health, after which the antitoxins are combined and standardized. Marketed in packages of one vial containing 1,500 units of tetanus antitoxin and 1,000 units of perfringens antitoxin; and in packages of one syringe containing 1,500 units of tetanus antitoxin and 1,000 units of perfringens antitoxin.

Dosage.—For prophylaxis, 1,500 units of tetanus antitoxin and 1,000 units of perfringens antitoxin injected intramuscularly or subcutaneously; for treatment, 6,000 or more units of tetanus antitoxin and 4,000 or more units of perfringens antitoxin injected intravenously.

Committee on Foods

REPORTS OF THE COMMITTEE

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COMMITTEE ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION FOLLOWING ANY NECESSARY CORRECTIONS OF THE LABELS AND ADVERTISING TO CONFORM TO THE RULES AND REGULATIONS. THESE PRODUCTS ARE APPROVED FOR ADVERTISING IN THE PUBLICATIONS OF THE AMERICAN MEDICAL ASSOCIATION, AND FOR GENERAL PROMULGATION TO THE PUBLIC. THEY WILL BE INCLUDED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION.

RAYMOND HERTWIG, Secretary.

STAUDT'S EXTRA FINE BREAD
(Successor to Butter-Nut Bread)

Manufacturer.—Staudt's Bakery, Raleigh, N. C.

Description.—A white bread made by the sponge dough method (as described in THE JOURNAL, March 5, 1932, p. 817); prepared from patent flour, water, sucrose, lard, powdered skim milk, salt, yeast, malt syrup and yeast foods containing calcium sulphate, ammonium chloride, sodium chloride and potassium bromate and a mixture of calcium acid phosphate and calcium peroxide.

Analysis (submitted by manufacturer).—

	per cent
Moisture (entire loaf)	35.5
Ash	0.9
Fat	1.4
Protein (N × 6.25)	10.0
Crude fiber	0.2
Carbohydrates other than crude fiber (by difference)	52.0

Calories.—2.6 per gram; 74 per ounce.

Claims of Manufacturer.—Conforms to U. S. Department of Agriculture definition and standard for white bread.

DICKINSON'S BIG BUSTER BRAND SOUTH AMERICAN VARIETY YELLOW POPCORN

Manufacturer.—The Albert Dickinson Company, Chicago and Minneapolis.

Description.—Canned South American variety yellow popcorn kernels with a proper moisture content for popping.

Manufacture.—South American yellow variety popcorn is "cured," prepared and canned as described for Dickinson's Little Buster Hulless Popcorn (THE JOURNAL, Sept. 17, 1932, p. 997).

Analysis (submitted by manufacturer).—

	per cent
Moisture	12.0
Ash	1.6
Fat (ether extraction method)	3.8
Protein (N × 6.25)	11.6
Crude fiber	2.5
Carbohydrates other than crude fiber (by difference)	68.5

Calories.—3.5 per gram; 99 per ounce.

Claims of Manufacturer.—Canned South American variety yellow popcorn, guaranteed to pop.

LeSTOURGEON'S KEW BEE BREAD
(Sliced and Unsliced)

Manufacturer.—George E. LeStourgeon, Bridgeton, N. J.

Description.—White bread made by the sponge dough method (method described in THE JOURNAL, March 5, 1932, p. 817); prepared from patent flour, water, sweetened condensed skim milk, lard, sucrose, salt, yeast and a yeast food containing calcium sulphate, ammonium chloride, sodium chloride and potassium bromate.

Analysis (submitted by manufacturer).—

	per cent
Moisture (entire loaf)	35.2
Ash	0.8
Fat	1.6
Protein (N × 6.25)	9.4
Crude fiber	0.3
Carbohydrates other than crude fiber (by difference)	52.7

Calories.—2.6 per gram; 74 per ounce.

Conforms to U. S. Department of Agriculture definition and standard for white bread.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, SEPTEMBER 24, 1932

THE CHOLESTEROL FUNCTION OF THE GALLBLADDER

The gallbladder, one of the smallest of the abdominal viscera, has been the subject of much interesting investigation. For a long time it was considered a mere passive diverticulum in the biliary tract. Because it was a frequent site of inflammation and often contained gallstones, the interest of pathologists and surgeons was aroused. The concentrating activity as demonstrated by Rous and McMaster in 1921 served to renew interest and initiated a series of investigations, which have been fruitful. While there still may be some dispute, it is generally agreed that this organ has an important motor function in the discharge of bile into the duodenum; that it absorbs, besides water and other substances, calcium and bile salts; that it excretes mucus, and that it makes the bile more acid. Thus it achieved a considerable dignity. It goes without saying that only such knowledge of its physiology can lead to a true understanding of its pathology and afford a rational approach to diagnosis and treatment.

The latest function to submit to investigation has been the problem of what the gallbladder does to cholesterol, a normal constituent of bile, present in nearly all gallstones, and responsible, too, for the peculiar white or yellow deposits in the so-called strawberry gallbladder. Naunyn's old idea that the gallbladder excretes cholesterol by desquamation of its cholesterol-containing cells gave way to the theory advanced by Aschoff and now generally accepted that the gallbladder mucosa absorbs cholesterol from the bile present in its lumen.

This theory was attacked by Elman and Taussig,[1] working at the Washington University School of Medicine. According to the evidence adduced by these workers from a variety of observations, cholesterol is not only not absorbed but is actually excreted by the gallbladder mucosa. This action was particularly profuse when inflammation was present, although it was observed in many experiments in which normal conditions were maintained. The investigators also found that even the cells lining the biliary ducts are able to excrete this lipoid. Appearing at about the same time were reports on experiments by Andrews, Schoenheimer and Hrdina[2] of the University of Chicago, who showed that while the cholesterol content of gallbladder bile increased following ligation of the cystic duct, owing presumably to excretion or concentration of the lipoid, marked inflammation was always present. They presented no data indicating what the gallbladder does to cholesterol under noninflammatory conditions. Riegel, Johnson and Ravdin[3] of the University of Pennsylvania have studied the effect on hepatic bile placed in the isolated lumen of the gallbladder of the dog. They found no evidence of absorption of cholesterol but likewise no evidence of excretion, save in one experiment in which inflammatory changes were present. They inferred from their one series of experiments, therefore, that cholesterol under normal conditions acts like bilirubin and is indifferent to the activity of the gallbladder mucosa.

From these studies it seems apparent that the Aschoff hypothesis of the absorption of cholesterol does not stand the test of further experimental investigation. Moreover, it is agreed that in the presence of inflammation the lipoid is, in fact, excreted by the gallbladder wall. The dispute at present concerns its behavior in the normal organ. Further investigation will perhaps settle this point.

From the practical point of view, however, it might be emphasized that the demonstration of excretion by the gallbladder has led, as pointed out by Elman and Graham,[4] to a convincing explanation of the pathogenesis of the well known "strawberry" gallbladder. The accumulation of cholesterol under the mucosa of these striking specimens is due, according to their hypothesis, to the fact that further excretion has become impossible because the bile is so saturated that it can no longer take up any more of the lipoid. This idea is substantiated by the observation that such bile contains a tremendously high concentration of cholesterol and often exhibits, in fact, shimmering crystals of it in suspension. The rôle of bile salts in promoting the solution of cholesterol is an additional factor of great importance. The investigation of this factor by the Chicago workers has added additional substantiation to this theory, for they have shown that, unlike cholesterol, the inflamed gallbladder absorbs bile salts and thus leads to conditions which render the bile even less able to take up the lipoid and, in fact, leads to the precipitation of it in the form of crystals or about other centers to form actual stones over the course of time.

1. Elman, Robert, and Taussig, J. B.: The Cholesterol Function of the Gallbladder, J. Exper. Med. **54**: 775 (Nov.) 1931.

2. Andrews, Edmund; Schoenheimer, Rudolf, and Hrdina, Leo: The Etiology of Gallstones, Proc. Soc. Exper. Biol. & Med. **28**: 944, 945, 947 (June) 1931.

3. Riegel, Cecilia; Johnston, C. G., and Ravdin, I. S.: Studies on Gallbladder Function, J. Exper. Med. **56**: 1 (July) 1932.

4. Elman, Robert, and Graham, E. A.: The Pathogenesis of the "Strawberry" Gallbladder, Arch. Surg. **24**: 14 (Jan.) 1932.

GASTRIC ACIDITY

Physiology is indebted to medicine for the establishment of norms for a large variety of bodily functions. Deviations from the normal can then be measured so as to afford signs of possible pathologic conditions that may be responsible for the aberrations. The range of normal variation for such manifestations as heart rate, body temperature, respiratory rhythm and blood pressure under established circumstances forms the basis for many clinical judgments. In recent years data secured by chemical rather than purely physical methods of measurement have come into increasing vogue. The estimates of basal metabolic rates and of the composition of the blood belong in this category. Although gastric analysis is by no means a recent procedure and the literature on the subject is enormous, there are few well founded generalizations as to the range of normal variation in gastric acid from youth to old age. In explanation of the lack of dependable standards it has been stated [1] that physicians have always been more ready to study disease and to treat it than to make the basic anthropologic and statistical studies that would make it possible to say where normality ends and disease begins. Furthermore, it is not easy to secure large numbers of healthy persons throughout the various age groups to submit to the discomfort of gastric intubation.

The problem of supplying "standards of normal" for gastric acid has been attacked with characteristic vigor at the Mayo Clinic by Vanzant, Alvarez, Eusterman, Dunn and Berkson.[1] Their conclusions are based on studies of nearly four thousand persons. Careful examination failed to reveal any disease that was likely to affect the mucous membrane or the secretory activity of the stomach. Free gastric acidity appears, in these records, to increase rapidly from childhood up to the age of 20 years, when adult values are reached. At about the age of puberty, the average value for boys begins to rise considerably above that for girls. The Rochester gastro-enterologists at first suspected that after middle age gastric acidity might gradually decrease and that this outcome might be due to progressive atrophy of the mucosa similar to that which takes place in the skin. The fact is, however, that there is no falling off in gastric acidity in older women; hence the decrease observed in men with growing age can scarcely be attributed to senile changes—otherwise one should expect comparable alterations in the two sexes. There is no significant variation in combined acidity at any age, and there are no differences between the sexes in this respect.

There seems to be a steady increase in the incidence of achlorhydria from youth to old age. It seems probable, however, that the process that gives rise to achlorhydria is different from the one which in men gradually reduces the degree of gastric acidity. It is possible that few clinicians have realized how big may be the normal differences between aging men and women with respect to gastric acidity. Without standards of normality based on elaborate studies of a sufficient number of persons, the decisions of possible abnormalities will never be thoroughly satisfactory.

1. Vanzant, Frances R.; Alvarez, W. C.; Eusterman, G. B.; Dunn, H. L., and Berkson, Joseph: The Normal Range of Gastric Acidity from Youth to Old Age, Arch. Int. Med. **49**: 345 (March) 1932.

CHANGES IN NASAL EPITHELIUM

Attention has lately been directed in THE JOURNAL [1] to a report by Hilding [2] describing the varying degrees of ciliary activity in the nasal mucosa. It was shown that in those areas in the nose and communicating passages to which the inspired air had more or less direct access there was decidedly less movement of the mucus overlying the epithelium. This functional response to exposure naturally raises the question of an associated structural differentiation; and, in a recent contribution, Hilding [3] has described his investigation of the alteration in morphology of the nasal epithelium in connection with changes in ventilation. The normal epithelium of the nose is not all alike; whereas in the preturbinal region it is deep but otherwise like squamous epithelium, it becomes thinner as the sections are taken from the turbinates, and farther posterior on the turbinates assumes a columnar character. Here a few cilia can be demonstrated. These morphologic variations are apparently correlated with a decreasing exposure to the currents of inspired air. In the posterior portion of the inferior turbinate, in the meatuses where the flow of air is less and in the sinuses, the epithelium is of either high or low columnar type and is well ciliated.

In order to demonstrate a change in morphology with change in ventilation, one nostril was closed in a series of experimental animals and the resulting alteration in the epithelium determined after varying intervals of time. In rabbits, on the open side where the air volume was doubled there was a loss of cilia and the epithelium of the septum assumed a stratified form, whereas on the closed side there was an increase of mucus-filled goblet cells without cilia. In the dog, after similar treatment, the epithelium of the septum on the closed side was transformed to the tall columnar type with many cilia. Changes in the lining membrane of other parts of the nose were in general similar, though less well marked; they were "in direct proportion to the exposure to the flow of air." In addition, there occurred a definite increase in the size of the turbinate on the open side.

The response of the epithelium was prompt, only a few months being required to induce these changes in the nasal structures in the species studied. The experi-

1. Drainage from the Nasal Mucosa, editorial, J. A. M. A. **98**: 1089 (March 26) 1932.
2. Hilding, Anderson: The Physiology of Drainage of Nasal Mucus, Arch. Otolaryng. **15**: 92 (Jan.) 1932.
3. Hilding, Anderson: The Physiology of Drainage of Nasal Mucus, Arch. Otolaryng. **16**: 9 (July) 1932.

ments point to the fact that the usual types of epithelium normally occurring in the nasal passages are not fixed but, by a simple change in the environment, can be interchanged. These observations illustrate again the remarkable powers of compensation possessed by the organism. The equilibriums of the body, the sine qua non of life, are maintained by a constant shifting of chemical and physical reactions, not, however, usually accompanied by alteration of the tissue. Most of the adjustments of structure to functional changes are quantitative in character; the change in the nasal mucosa is all the more striking in that it involves what might be called a qualitative response.

SYNTHETIC BACTERIA

Among the wizardries of the newer pleomorphic bacteriology, none are of greater interest than the recent test-tube syntheses of what may be described as composite pneumococci. The burbankian magic at the Rockefeller Institute of grafting an alien capsule on a naked bacterial cell may not be of immediate practical interest, but it may serve as an introduction of clinical medicine to the complexities in this field.

It is now apparently confirmed that if pure cultures of virulent type pneumococci are grown under certain suboptimal conditions they "dissociate" into mixed cultures of two or more different morphologies, specificities, virulences or cultural characteristics. An avirulent, non-type-specific, noncapsulated pneumococcus "mutant," for example, is readily produced. This naked "involution form" is apparently incapable of forming the type-specific capsular polysaccharide and breeds true as a noncapsulated entity for innumerable test-tube generations. Four years ago, Griffith [1] injected this naked "degenerate" of known ancestral type-specificity subcutaneously into mice, together with a relatively large dose of heat-killed capsulated pneumococci of a second antigenic type. Living, virulent, capsulated pneumococci were subsequently recovered from the heart blood. The apparently "regenerated" capsule, however, was not of the original ancestral type but duplicated or at least simulated the capsular specificity of the simultaneously injected heat-killed vaccine. The same metaphoric "transformation" or "ongrafting" of an alien capsule was afterward accomplished in vitro by Dawson and Sia,[2] who cultivated the naked cells in broth containing anti-"somatic" serum plus the heat-killed alien type-specific vaccine. Alloway [3] reports a similar but more difficult test-tube synthesis by growing the naked bacteria in the presence of "somatic" antiserum plus a relatively large amount of heat-killed alien pneumococcus filtrate. The "somatic" antiserum is apparently a necessary synthesizing agent between the filtrate and the naked cells, though the nature of this metaphoric "synthesis" is wholly unknown.

On the final interpretation of such "transformations," much of future theory in the field of immunity and infection may depend. Perhaps such modifications or "ongraftings" in tissue cells constitute the basic mechanism of specific immunologic adaptations.

1. Griffith, Frederick: J. Hyg. **27**: 113 (Jan.) 1928.
2. Dawson, M. H., and Sia, R. H. P.: Proc. Soc. Exper. Biol. & Med. **27**: 989, 1930; J. Exper. Med. **54**: 681, 701 (Nov.) 1931.
3. Alloway, J. L.: J. Exper. Med. **55**: 91 (Jan.) 1932.

Current Comment

THE DEATH OF RONALD ROSS

Sir Ronald Ross, discoverer of the method of transmission of malaria by the anopheles mosquito, died in London, September 16, at the age of 75. His career was dramatic. He was born in India in 1857, three days after the outbreak of the Indian mutiny. His education, in England, was marked by much attention to mathematics and to literature. At seventeen, as told by Dr. Claude Lillingston in the current issue of *Hygeia*,[1] he wanted to become an artist but his father urged him to study medicine and to enter the Indian Medical Service. He passed the examination of the college of surgeons in 1879. In 1881, after serving briefly as a ship surgeon, he entered the Indian Medical Service. In the course of his studies on tropical medicine and hygiene he became familiar with the work of Laveran and of Manson. The meeting with Manson was the turning point in his career. Both Manson and Laveran had suggested that the mosquito must be a carrier of malaria. Before leaving England in March, 1895, Ross won a prize for an essay on malaria. Within the next few years he made hundreds of tests to determine the exact relationship of the mosquito to the transmission of disease. Constantly he was in communication with Manson, who encouraged him and advised him and who worked with state officials to give Ross the facilities needed. Finally on August 20, 1897, he saw under the microscope in the stomach of a mosquito the evidence that the mosquito transmits malaria. For his discovery, Dr. Ross received the Nobel Prize in medicine; he also was the recipient of numerous honors and decorations. His name belongs with that of the medical immortals.

HYPERVITAMINOSIS

Experimental pathology has been so largely interested in the clinical effects of vitamin deficiency that the possibility of equally serious pathologic results from overdoses of accessory food factors has been discounted. Indeed, it is alleged, usually by enthusiastic promoters of commercial preparations, that such overdoses can only be beneficial, increasing bodily resistance to common colds and other microbic infections. Grauer [1] reports experimental evidence that vitamin D, given in excess to guinea-pigs, leads to distressing constitutional symptoms and serious bone lesions. When normal control guinea-pigs were on a well balanced diet, as much as 2 mg. of irradiated ergosterol

1. Lillingston, Claude: Sir Ronald Ross, Hygeia **10**: 917 (Oct.) 1932.
1. Grauer, R. C.: Proc. Soc. Exper. Biol. & Med. **29**: 466 (Jan.) 1932.

(vitamin D) could be added to this daily diet without demonstrable pathologic effects. When the daily dose was increased to 5 mg., however, bone lesions developed. In their simplest form the lesions consisted of a thickening of the fibrous layer of the periosteum. In more aggravated forms they simulated osteitis fibrosa cystica. There was a thinning of the corticalis, widespread fibrous connective tissue replacement, and areas of hemorrhage in the marrow cavities. Later resorption of the hemorrhagic areas led to cystlike spaces. The general symptomatology was loss of weight, apathy and marked muscular weakness. There was a distinct rise in blood calcium. Thus far reports of damage to human beings who have taken even large doses of viosterol over long periods of time have not appeared in medical literature. There would seem to be plenty of evidence, however, that vastly excessive doses, long continued, may produce serious changes. One may also conceive of the possibility of persons who may respond excessively to such preparations.

MINERAL SKELETONS OF MALIGNANT CELLS

Scott's [1] recently perfected micro-incineration technic for the preparation of mineral skeletons of tissue cells has already led to surprising evidence in relation to Cohnheim's "embryonal theory" of malignancy.[2] The method also bids fair to develop into a valuable technic in numerous fields of clinical research. Specially mounted paraffin sections of fixed tissues are carefully incinerated. The inorganic salts which are not volatilized in the electric furnace retain the same topographic distribution in the ash as in the original cells. Certain of the mineral components, such as iron, calcium and silicates, can be identified microscopically. Scott and Horning [2] found an extraordinary concentration of inorganic salts in both malignant and embryonic cellular skeletons, which is in accord with the Cohnheim theory. The increase in the malignant skeletons was mainly along the peripheral margins of the nuclei, the perinuclear ash being particularly rich in iron.

Association News

MEDICAL BROADCAST FOR THE WEEK

American Medical Association Health Talks

The American Medical Association broadcasts on Monday and Wednesday from 10:45 to 10:50 a. m. over Station WBBM (770 kilocycles, or 389.4 meters). The Columbia chain program has been discontinued for the present.

The subjects for the week are as follows:

September 26. Percussion.
September 28. Diphtheria Must Go.

There is also a fifteen minute talk sponsored by the Association on Saturday morning from 10:45 to 11 over Station WBBM.

The subject for the week is as follows:

October 1. Childhood Tuberculosis.

This schedule is based on central standard time.

1. Scott, G. H.: Proc. Soc. Exper. Biol. & Med. **29**: 349 (Jan.) 1932.
2. Scott, G. H., and Horning, E. S.: Am. J. Path. **8**: 329 (May) 1932.

DEATH OF DR. FRANK BILLINGS

As THE JOURNAL goes to press, news is received of the death of Dr. Frank Billings at his home in Chicago, September 20, aged 79. Dr. Billings was twice President of the American Medical Association, and for many years a member, and Secretary, of the Board of Trustees, and rendered many other distinguished services to American medicine. A formal obituary will appear in THE JOURNAL, October 1.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Lectures on Heart Disease.—The Los Angeles County Heart Association arranged a program of clinical lectures on heart disease for September 23-24 to commemorate the one hundredth anniversary of the work of Dominic John Corrigan on heart disease. Among the speakers on the program were Drs. John C. Ruddock, on "Heart Disease—Its Present Status in the United States"; William H. Leake, "Coronary Disease and Angina Pectoris"; George Dock, "Dominic John Corrigan—His Place in the Development of Our Knowledge of Heart Disease"; Robert W. Langley, "Cardiac Problems in Surgery, Pregnancy and Acute Infections," and Arthur Stanley Granger, "Hypertensive Heart Disease."

Health Officers Hold Meeting.—The health officers' section of the League of California Municipalities, meeting in San Diego, September 26-28, will include, among others, the following speakers on its program: Karl Meyer, Ph.D., Hooper Foundation for Medical Research, San Francisco, psittacosis; Dr. William C. Voorsanger, San Francisco, president, California Tuberculosis Association, control of tuberculosis; Dr. Charles W. Decker, city health officer of Los Angeles, economic and medical aspect of dairy inspection; Dr. Olive V. B. Cordua, director of child hygiene, San Diego, a comparative study of Mexican and white infant mortality rates, and Dr. Platt W. Covington of the Rockefeller Foundation, milk-borne epidemics.

CONNECTICUT

Child Health Conferences.—The opening of the Thomaston Well Child Conference, July 28, brought the total of such conferences under the supervision of the state health department to seventy-five. Forty-four children were examined on the first day of operation of the Thomaston conference. Prior to its opening, local stores cooperated by inserting announcement slips in packages and grocery orders.

New Experimental Laboratory at Yale.—Construction is to start at once on an experimental laboratory adjoining the Yale University School of Medicine, New Haven, in which investigations will be conducted on ventilation, cooling and heating, according to an announcement, September 9. The new three-story building, which will be known as the Thermo-Hygiene Laboratory, will be on the corner of Congress and Liberty streets. The equipment will include two suspended experimental rooms, 15 feet long, 12 feet wide and 9 feet high, in which it will be possible to produce and maintain any desired temperature, humidity and air motion. Research activities will be in charge of Dr. Leonard Greenburg and L. P. Herrington of the department of public health at Yale, under the general supervision of Charles-Edward A. Winslow, Dr.P.H., professor of public health. Funds for the building have been provided by the John B. Pierce Foundation, which was established in 1924 to support research work "in connection with the sanitary and hygienic security of human beings and their habitations."

DELAWARE

Society News.—The New Castle County Medical Society was recently addressed in Wilmington by Drs. Owen J. Toland, Philadelphia, and Aaron Lovett Dewees, Ardmore, Pa., on "Prophylactic Obstetrics" and "Technic of Contraception," respectively. Dr. Thomas Klein, Philadelphia, addressed a recent meeting of the society on cancer of the stomach.

State Medical Meeting at Lewes.—The Medical Society of Delaware will hold its one hundred and forty-third annual session in Lewes, September 27-28, under the presidency of Dr. Ulysses W. Hocker, Lewes. The scientific program will include

addresses by Drs. William A. Frontz, Baltimore, on "Hematuria: With Special Reference to the Importance of an Early Recognition of the Conditions Causing It"; Willard F. Preston, Wilmington, "Vaginal Hysterectomy"; Ervin L. Stambaugh, Lewes, "Ludwig's Angina"; William Oscar LaMotte, Wilmington, "Precautions in Tonsil Operations: With Special Reference to the Blood Supply"; Peter W. Tomlinson, Wilmington, "The Progress of Medicine in the Last Half Century"; Hyman I. Goldstein, Camden, N. J., "Recent Advances in Treatment"; Brice S. Vallett, Wilmington, "Intra-Urethral Correction of Bladder Neck Obstruction"; Max J. Exner, New York, "Congenital Syphilis"; George C. McElfatrick, Wilmington, "The Newest Technic of High Voltage X-Ray Treatment of Carcinomatous Areas of the Human Body"; Bartholomew M. Allen, Wilmington, "X-Ray Interpretations of the Changes in Cardiac Morphology in Early Lesions"; Mark B. Holzman, Wilmington, "Value of Diet in the Treatment of Arthritis and Migraine"; John C. Pierson, Wilmington, "Some Common Complications in Surgery," and Mr. Gilbert T. Stephenson, Wilmington, "Washington: The Physical Man." Dr. William P. Orr, Jr., Lewes, will give the presidential address on "Statutory Safeguards to Health." Mrs. Augustus Kech, president-elect of the Pennsylvania woman's auxiliary, will address the auxiliary of the Medical Society of Delaware, September 28, on "Women in Medical Legislation."

DISTRICT OF COLUMBIA

Hospital News.—A new contagious disease building will soon be constructed as a part of the Gallinger Municipal Hospital, Washington. Preliminary plans call for a building of 150 beds, to be built at a cost not to exceed $600,000.

Personal.—Capt. Joel T. Boone, U. S. Navy, physician to President Hoover, has been nominated an officer in the Legion of Honor of France.——Rear Admiral Charles E. Riggs, Surgeon General, U. S. Navy, was recently made an honorary member of the American College of Dentists in recognition of his services in the advancement of the science and art of dentistry. This is said to be the first time this honor has been conferred on a member of the medical profession.

FLORIDA

State Board Election.—Dr. Carl A. Williams, St. Petersburg, was recently elected president of the Florida State Board of Medical Examiners to succeed Dr. Thomas W. Hutson, Miami; Dr. John D. Raborn, Trenton, was elected vice president, and Dr. William M. Rowlett, Tampa, was reelected secretary.

ILLINOIS

Epidemic Disease.—Whooping cough, with about 110 new cases weekly, is the most prevalent epidemic disease in Illinois at present, states the Illinois *Health Messenger*, September 15. Whooping cough has been unusually prevalent the last two years. Typhoid accounts for the worst current health situation so far as epidemic diseases are concerned, the report continued, with case reports up through the thirty-fifth week of 1932 nearly double the incidence for the corresponding period of 1931. Late in August a sharp decline in cases was noted. However, the bulletin pointed out, there were no epidemics due to this cause. Diphtheria has never been less prevalent in the state; measles is at a low ebb and smallpox is practically nonexistent. Early in the season infantile paralysis manifested threatening epidemic signs but dropped to an average of about six new cases each week in August, a number far below that of 1931.

Chicago

Professor Curtis Wins Golf Trophy.—For the third successive year Dr. George M. Curtis won the University of Chicago Clinics golf tournament, giving him permanent possession of the silver cup. Dr. Curtis recently resigned as professor of surgery at the university to accept a similar position at Ohio State University College of Medicine.

Miller Denied Release from Jail.—W. H. H. Miller, former head of the state department of education and registration, has been denied a release from the county jail, where he has been serving sentence for operating a fraudulent diploma mill as a state official. In his petition for release Miller stated that he was penniless, having transferred all his property to his wife in Champaign, according to the Chicago *Tribune*. The judge indicated at a previous hearing that the property transfer was fraudulent. Miller will not be released until he has paid the $2,000 fine which was imposed by a jury the same time as the sentence, Dec. 10, 1929. Miller had been found guilty of conspiracy to sell medical and dental licenses to persons not licensed to practice (THE JOURNAL, Jan. 30, 1932, p. 408).

INDIANA

Health Department at Butler University.—The appointment of Dr. Joseph T. C. McCallum as physician to Butler University, Indianapolis, is said to be the first definite move to create a health and recreational department at the university. Dr. McCallum will continue to act as physician to the university teams, which position he has held since 1928. He will also give courses in first aid and hygiene.

Society News.—Dr. Frank C. Mann, Rochester, Minn., addressed the Terre Haute Academy of Medicine, September 2, on gastric ulcer.——Dr. Theodore D. Rhodes, Indianapolis, addressed the Grant County Medical Society at Marion, August 31, on "Treatment of Skin Diseases."——Dr. Herman L. Kretschmer, Chicago, addressed the Elkhart County Medical Association at Elkhart, September 2, on "Nonoperative Treatment of Bladder Neck Obstructions with the Resectoscope."——At the September 8 meeting of the Tippecanoe County Medical Society in Lafayette, Dr. Walter L. Bruetsch, Indianapolis, spoke on "Pathology and Treatment of Neurosyphilis," and Dr. Albert Murray DeArmond, Indianapolis, "Mental Mechanisms in Psychoneurosis."

IOWA

Public Health Meeting.—The annual meeting of the Iowa Public Health Association will be held at the Hotel Savery, Des Moines, October 6-7. Among the speakers will be Charles Murray, D.V.M., Ames, "The Veterinarian's Interest in Public Health"; J. J. Hinman, Iowa City, "Building and Maintenance of Swimming Pools," and Dr. John T. McClintock, Iowa City, "Energy Cost of Work in Normal Children." Dr. John W. Trask, medical director, U. S. Marine Hospital, Chicago, will deliver the banquet address, on "Public Health Problems, Present and Future."

Course on Fundamentals.—The speakers' bureau of the Iowa State Medical Society, in cooperation with the section on ophthalmology and otolaryngology of the Polk County Medical Society, announces the following series of lectures on the fundamentals of medicine, to be held in Des Moines:

October 7, Recent Conceptions of Immunity, Dr. Ludvig Hektoen, Chicago.
October 14, Cellular Immunity, Dr. Paul R. Cannon, Chicago.
October 21, Inflammation, Dr. Harold E. Robertson, Rochester, Minn.
October 28, Focal Infections, Dr. Henry L. Ulrich, Minneapolis.
November 4, Rheumatic Disease, lecturer to be announced.
November 11, Blood Diseases in Relation to Eye, Nose and Throat, Dr. Clarence W. Baldridge, Iowa City.
November 18, Sympathetic Nervous System, Dr. Clifton F. McClintic, Detroit.
December 2, Arteriolar Changes in Hypertension, Drs. Elexious T. Bell, Minneapolis, and Henry P. Wagener, Rochester, Minn.
December 9, Chemotherapy, Dr. Torald H. Sollmann, Cleveland.
December 16, Malignant Tumors of the Head, Dr. Gordon B. New, Rochester, Minn.

The number who may enroll is limited to 100; a fee of $20 will be charged.

KENTUCKY

Hospital News.—Riverview Hospital, Louisa, closed for several years, has recently been reopened under the management of Drs. Joseph E. Carter and August M. French, both of Louisa.——William Booth Memorial Hospital, Covington, operated by the Salvation Army, was closed, September 1, for lack of funds.

Personal.—Dr. James W. Scudder, Calhoun, has resigned as health officer of McLean County to accept a position as assistant field director of the state board of health.——Dr. Burman H. Preston, Pikeville, has succeeded Dr. Carl N. Gambill as health officer of Magoffin County.——Dr. John C. McGuire, formerly of Jackson, has been appointed health officer of Lincoln County, and Dr. Henry G. Wells, Russell, of Madison County. Dr. Wells succeeds Dr. Lewis C. Coleman.——Dr. Lynn D. Adams, Smithland, has been appointed physician to the state reformatory at Frankfort, succeeding Dr. Finis M. Travis.

LOUISIANA

Society News.—Dr. Emeric De Nux, Echo, addressed the Avoyelles Parish Medical Society in Moreauville, recently, on eclampsia. Dr. De Nux was made an honorary member of the society.

Changes at Louisiana University.—Dr. Urban Maes, for many years professor of clinical surgery at Tulane University of Louisiana School of Medicine, New Orleans, has been appointed head of the department of surgery at the Louisiana State University Medical Center. He will succeed Dr. Emmett L. Irwin. Dr. James Davidson Rives has been appointed professor of clinical surgery and Dr. Rudolph H. Kampmeier,

Pueblo, Colo., assistant professor of medicine. Dr. Clyde Brooks, professor of physiology and pharmacology, University of Alabama School of Medicine, has also been added to the staff as professor of physiology. Other changes include the resignations of Dr. Waldemar R. Metz as assistant professor of surgery at the center, and of Dr. Martin O. Miller as instructor in surgery.

MARYLAND

Personal.—Dr. John Jacob Abel, who recently retired as professor of pharmacology at Johns Hopkins University School of Medicine, Baltimore, received the honorary degree of doctor of laws at the annual commencement of the University of Aberdeen, Scotland, July 7.

Another Full Time County Health Unit.—Charles County has been added to the list of counties in the state where full time health service is now in operation. Dr. Donald St. Clair Campbell is the new full time health officer and deputy state health officer for the county, with headquarters at La Plata. Dr. Campbell has been deputy state health officer for the sanitary district composed of Charles and St. Mary's counties since Dec. 1, 1929. Of the twenty-three counties in the state, St. Mary's and Caroline counties are the only two now on a part time basis.

Outbreak of Gastro-Enteritis.—During the period from July 20 to July 25 an outbreak of illness occurred among about 600 residents of Baltimore, characterized by cramps, diarrhea, vomiting and general prostration. An investigation by the city and state health departments, with assistance from Johns Hopkins University School of Hygiene and Public Health, showed that these people had at one time or another during the interim attended picnics at a beach resort about eighteen miles from the city in one of the neighboring counties. Apparently all the sick persons drank unpurified well water at this place or beverages made with the water. A sample of the water, obtained July 26, disclosed that the supply was polluted. Use of the water supply was discontinued and there has been no recurrence of cases, according to Baltimore *Health News*. Epidemiologic studies to ascertain the exact nature and cause of the illness are now being conducted.

MASSACHUSETTS

Licenses Suspended.—At a hearing before the board of registration in medicine, August 25, the license of Dr. Elia J. A. Calicchio, Boston, was suspended for one month, for "gross misconduct in the practice of his profession as shown by deceit in his testimony before the Industrial Accident Board." The license of Dr. Henry O. Lacey, Cambridge, was suspended for one month at this time for gross misconduct in the practice of his profession "as shown by deceit in the matter of charging for services which he did not render."

New Springfield Hospital.—The new Springfield Hospital was recently opened at an approximate cost of $3,500,000. It is of collegiate Gothic architecture, situated in the midst of thirty acres of land. The building has a capacity of 323 beds, but owing to lack of funds only the central section has been opened. One hundred and sixty-six beds in this section are now occupied, arrangements having been made to accommodate private, semiprivate and ward patients. There is a laboratory on each floor. The program of dedication of the hospital included addresses by Mayor Dwight Winter, Dr. Ralph H. Seelye and Dr. Frederic A. Washburn, director of the Massachusetts General Hospital, Boston. Various clinics were held in the departments as a part of the dedicatory ceremony. Dr. Edmund Eugene W. Walker is superintendent of the institution.

MICHIGAN

Society News.—Dr. Charles L. Brown, Ann Arbor, addressed the Calhoun County Medical Society, September 1, in Battle Creek, on "Diagnostic Appraisal of Chronic Abdominal Diseases."——Drs. Robert L. Novy and Alfred D. Laferte, Detroit, addressed the Lenawee County Medical Society, Adrian, September 20, on diseases of the coronary artery and fractures, respectively.

Dr. Christian Honored.—Dr. Edmund A. Christian, Pontiac, was honored by friends and associates at a dinner, September 7, celebrating his seventy-fifth birthday. In recognition of his fiftieth year in the practice of medicine in the state, a bronze plaque, executed by Carleton Angell, was unveiled during the dinner. It will be hung in the administration building of the Pontiac State Hospital, where, for thirty-eight years, Dr. Christian has been superintendent. A morocco-bound volume of forty letters of congratulations from fellow life members of the American Psychiatric Association was also presented to Dr. Christian during the dinner. Dr. James D. Bruce of the University of Michigan Medical School, Ann Arbor, gave the principal address, on "The Durable Satisfactions of Life." Other speakers included R. G. Ferguson, Sault Ste. Marie, chairman, state hospital commission; Junius E. Beal, regent of the University of Michigan; Drs. Robert L. Dixon, Lapeer, and Irwin H. Neff, Detroit, and Governor W. M. Brucker. Dr. Christian became a member of the staff of Pontiac State Hospital in 1885, and superintendent in 1894.

MINNESOTA

Dr. Learmonth Returns to Scotland.—Dr. James R. Learmonth, assistant professor of surgery, Mayo Foundation, University of Minnesota, has been appointed regius professor of surgery in the University of Aberdeen, Scotland, effective September 30. This appointment was made by King George of England on the recommendation of the secretary of state for Scotland, newspapers reported. Dr. Learmonth, a native of Scotland, came to Rochester as a voluntary special student in 1924. In July the following year he returned to Scotland as assistant to the regius professor of surgery at the University of Glasgow but returned to the United States in 1928. He succeeds Sir John Marnoch.

Jerry Castle Victimizes Duluthians.—Director of Public Health Dr. Mario McC. Fischer of Duluth reports that one A. L. (Jerry) Castle, alias Ernest Donald Roberts, has recently victimized a number of Duluth citizens. According to Dr. Fischer, Castle pretended to be a physician on vacation from Honolulu. His method of approach was through the interns of a local hospital, to whom, for a few weeks, he was extremely gracious and whom he entertained generously and at times lavishly. Following Castle's sudden departure, a crop of bad checks turned up. Castle, it is said, claims to be Welsh and to have had his training in England. He speaks English, French, German and Greek, and has a foreign accent. He has a knowledge of medicine and of prominent medical men, his manner is gracious and polite, and he converses intelligently on music and literature as well as on medicine. He is a good polo player. The description of his physical appearance is: well dressed, black mustache, dark hair, swarthy complexion, height about 5 feet 8 inches, age about 30, weight about 150 pounds, hazel gray eyes, nose inclined to the Roman type, teeth unusually white and even. As recently as September 4 he was known to be in Minneapolis. Dr. Fischer sends this information in the belief that other hospitals, medical centers and physicians may be victimized.

MISSISSIPPI

Graduate Institute.—The East Mississippi Post Graduate Medical Institute convened in Meridian, August 16-18. The program included the following speakers: Drs. Alfred Blalock, Nashville, Tenn., "Treatment of Nontuberculous Infections of the Chest"; James B. McElroy, Memphis, Tenn., gallbladder disease; Horton Casparis, Nashville, "Nutrition of Sick and Well Children." The East Mississippi Medical Association met jointly with the institute, Thursday. Dr. James M. Acker, Jr., Aberdeen, president of the state medical society, was a guest at the meeting.

MISSOURI

Jubilee of Tuberculosis Society.—The Missouri Tuberculosis Association held its twenty-fifth anniversary meeting at Jefferson City, September 20-21, under the presidency of Dr. George H. Hoxie, Kansas City. The scientific program included the following speakers and their subjects: Drs. Elmer E. Glenn, Mount Vernon, "Early Diagnosis of Pulmonary Tuberculosis in the Adult"; Samuel H. Snider, Kansas City, "Artificial Pneumothorax"; Jesse E. Douglass, Webb City, "Protecting the Contact Case"; Malcolm A. Bliss, St. Louis, "Mental Care of Patients in State Institutions," and James Lewald, St. Louis, "Care of the Mentally Defective in Missouri." Dr. Mazyck P. Ravenel, Columbia, was the principal speaker at the anniversary banquet, Tuesday evening, September 20.

MONTANA

Society News.—About 70 per cent of the physicians registered within 150 miles of Butte attended two medical meetings there recently, some driving from 50 to 150 miles to be present. Dr. Porter P. Vinson, Rochester, Minn., lectured in Butte, July 26, on malignant conditions of the lung and bronchi, and Dr. John P. Caffey, New York, gave an address, August 23, on tuberculosis in infancy and childhood.

NEBRASKA

Society News.—The medical society of Cedar, Dixon, Dakota, Thurston and Wayne counties met in Wakefield, August 25, with the following speakers: Drs. John W. Duncan, Omaha, on acute injuries; Floyd S. Clarke, Omaha, infant feeding, and Robert H. McBride, Sioux City, meningitis in children.

Annual Registration Due October 1.—All practitioners of medicine and surgery holding licenses to practice in Nebraska are required by law to be registered annually on or before October 1, with the department of public welfare, and at that time to pay a fee of $1. A license expires by the failure of a licentiate to register. The department, however, suspends action for thirty days when, if the registration fee and a penalty of $1 are not paid, the license is revoked.

NEW MEXICO

New Reportable Diseases.—Relapsing fever and psittacosis have been added to the list of notifiable diseases by the state director of health, acting under authority of the state board of public welfare. Cases of relapsing fever have been reported in adjoining states, but none are known to have occurred in New Mexico up to the present. Importation by the Indians of parrakeets, for use in ceremonials, is believed to be a potential source of psittacosis infection.

NEW YORK

Study of Maternal Mortality.—A cooperative study to determine as far as possible the "primary, avoidable factor" in puerperal deaths is being carried out by the state and county medical societies and the state department of health. The study includes all deaths of women occurring in the current year. The data are obtained as soon as possible after the death by a qualified physician representing the health department or by the county health commissioner. Information is sought from the person who signs death certificates or any and every physician or midwife who saw the patient; from the hospital if death occurred in a hospital, and from the family when advisable for economic status, previous illnesses, previous obstetric history or to supplement incomplete data from other sources. The final report will be a joint report of the New York State Medical Society and the State Department of Health. It is hoped that the facts presented will not only point the way to a better understanding of avoidable factors but also provide practical suggestions for better protection of expectant mothers in New York and elsewhere.

New York City

Lectures on Dental Medicine.—The dental department of Mount Sinai Hospital will sponsor its second series of lectures on dental medicine with a lecture each month during the winter. Dr. Bernard S. Oppenheimer will deliver the first address, October 11, on physical diagnosis. Among other speakers will be Drs. Abraham O. Wilensky, on osteomyelitis; Kaufman Schlivek, dental disease in relation to diseases of the eye; Joseph H. Globus, disorders of the fifth and seventh nerves, and Louis Gross, etiology of rheumatic fever.

Instruction in Tuberculosis.—The department of health in cooperation with the Bellevue-Yorkville Health Center is offering a course of lectures on tuberculosis to physicians. Dr. James Alexander Miller spoke, September 14, on "The General Practitioner and the Tuberculosis Problem" and Dr. George G. Ornstein, September 21, on "Sanatorium Care in Treatment of Tuberculosis." Coming lectures will be as follows: Drs. Edward P. Eglee, September 28, on collapse therapy; Eugene L. Opie, October 5, significance of childhood tuberculosis; James Burns Amberson, Jr., October 12, the roentgen ray (paper and celluloid films) and the fluoroscope as aids in diagnosis, and Linsly R. Williams, October 19, economic and social aspects.

Hospital News.—A research clinic for hay fever patients who do not react to vaccine therapy has been established at Vanderbilt Clinic.——The Gouverneur Hospital has recently established a gastro-enterologic clinic, with Dr. Joseph M. Marcus as chief.——Formal affiliation of the School of Nursing of New York Hospital with the College of Home Economics of Cornell University was effected with the opening of the New York Hospital-Cornell University Medical Center, September 1. Students completing a three-year course in the school of nursing will receive from one and one-half to two years of credit toward a bachelor's degree in the college. Miss Anna D. Wolf, formerly associate professor of nursing and superintendent of nurses at the University of Chicago Clinics, will be director of the school.

Changes at Rockefeller Institute.—The board of scientific directors of the Rockefeller Institute for Medical Research has announced a number of changes in the staff. New appointments are as follows: Francis O. Holmes, Sc.D., associate member; Dr. Joseph W. Beard, William F. Bruce, Ph.D., Merrill W. Chase, Ph.D., Herald R. Cox, Sc.D., Dr. George L. Fite, Roger M. Herriott, Ph.D., Samuel E. Kamerling, Ph.D., Dr. Malcolm H. Merrill, Dr. Johannes K. Mcen, Mr. William C. Price, Dr. Edward S. Rogers and Dr. Jerome T. Syverton, all assistants; and Anton Schormueller, Ernest L. Spencer, Ph.D., Erich Traub, V.M.D., and Philip R. White, Ph.D., fellows. Dr. Albert E. Casey and Robert C. Elderfield, Ph.D., were promoted to associates and James H. Jensen was promoted to assistant. Dr. Philip Levine has accepted an appointment as instructor in pathology and bacteriology at the University of Wisconsin Medical School, Madison. Dr. Harold J. Stewart has been appointed associate professor of medicine, Cornell University Medical College, and attending physician at New York Hospital; Dr. James Lionel Alloway, assistant professor of bacteriology at Cornell; Dr. Douglas H. Sprunt, assistant professor of pathology at Duke University School of Medicine, Durham, N. C.; Dr. Filip C. Forsbeck, research epidemiologist to the state of Michigan, Lansing, and Dr. Ralph E. Knutti, resident pathologist at Strong Memorial Hospital, Rochester, N. Y.

NORTH CAROLINA

Society News.—Dr. Powell G. Fox, Raleigh, presented a paper on pyelitis before the Wake County Medical Society, Raleigh, July 14.——Dr. Wilburt C. Davison, Durham, discussed pediatrics at a meeting of the Buncombe County Medical Society at Asheville, August 1.

Personal.—Dr. Douglas H. Sprunt, New York, has accepted an appointment as assistant professor of pathology at Duke University School of Medicine, Durham, and Dr. Ernest M. Poate, Southern Pines, has been appointed professor of psychiatry. Dr. Poate was formerly associated with several New York institutions for mental disease.

OHIO

Contaminated Springs.—Six springs in Cleveland, four of them in parks, have been ordered closed by the city health commissioner in a campaign against typhoid. He said that the so-called springs were not natural springs but seepage of storm and sanitary sewer water to the surface. None of the eleven cases of typhoid reported in the city in August were traced to these sources.

Dr. Bauer to Give Lectures.—Dr. Julius Bauer, professor of medicine, University of Vienna, Austria, will present the fourth annual graduate course of the Lima and Allen County Medical Academy, Lima, September 26-30. His subjects will include constitutional factors in disease; hyperthyroidism; obesity; arterial hypertension; so-called rheumatism; hepatosis, and diseases of the pituitary gland.

Society News.—Dr. Curtis C. Mechling, Pittsburgh, addressed the Jefferson County Medical Society, Steubenville, August 26, on "Diagnosis and Treatment of Malignant Rectal Tumors."——Dr. Frank Gordon Lawyer, Cambridge, addressed the Guernsey County Medical Society, August 25, on prostatitis.——Dr. Harold H. Wagner, Dayton, addressed the Miami County Medical Society, Troy, September 2, on "Gynecological Conditions of Interest in General Medical Practice."——With the opening of its fall season the Toledo Academy of Medicine will inaugurate a program of scientific exhibits. They will be presented by individuals or groups of members of the academy and will be demonstrated every Friday night for a month, new exhibits being installed each month.

Northwestern Ohio Medical Association.—The eighty-eighth annual meeting of the Northwestern Ohio Medical Association is to be held in Lima, October 4. On the morning program will be Drs. William J. Dieckmann, Chicago, speaking on "Toxemias of Pregnancy"; Ferris Smith, Grand Rapids, Mich., "The Chronic Sinus in Its Relation to Asthma and Bronchitis—Its Proper Management," and Edward D. Spalding, Detroit, "Clinical Applications of Electrocardiography." In the afternoon, speakers will be Drs. Richard B. Cattell, Boston, "Treatment of Carcinoma of the Colon and Rectum"; Harry M. Weber, Rochester, Minn., "Roentgenological Manifestations and Differential Diagnosis of Neoplasms of the Large Intestines"; A. Graeme Mitchell, Cincinnati, "Applications of the Principles of Nutrition to Daily Practice,"

and Herman L. Kretschmer, Chicago, "Treatment of Prostatic Obstruction with the Electroresectoscope." Dr. Frank H. Lahey, Boston, will be the speaker at the evening session on "Medical and Surgical Treatment of Gastric and Duodenal Ulcers."

PENNSYLVANIA

Memorial Dedicated. — A memorial tablet to General Edward Hand, an officer in the colonial army during the Revolution, was dedicated, September 5, on the site of the Hand Hospital, built by the general in 1773. It is said to have been the pioneer dispensary of the time and the first federal hospital west of the Alleghenies. Officials of Crafton and members of the State Society of Shrines of the American Revolution sponsored the memorial.

Personal. — C. Leonard O'Connell, associate dean of the University of Pittsburgh School of Pharmacy for the past two years, has been elected dean. He succeeds Julius Arnold Koch, Pharm.D., who has become dean emeritus after forty-one years' service as dean and fifty years with the school.—— Dr. Louis P. McCormick, Connellsville, was honored by the Connellsville hospital staff on his sixty-fifth birthday, August 19, at a dinner given by Dr. James L. Cochran. A desk set was presented to Dr. McCormick.

Philadelphia

Poliomyelitis Retards Opening of Schools.—Twenty-one new cases of poliomyelitis reported, September 14, caused Dr. J. Norman Henry, director of public health, to order the opening of Philadelphia schools to be postponed to September 27. The opening had previously been deferred until September 20. Sabbath schools and "all other places where persons under 18 may congregate" were included in the closing order. Several suburbs have also postponed the opening of schools, and other neighboring towns, especially in New Jersey, were forced to close them after they had begun the fall term. From July 1 to September 14, 555 cases had been reported in Philadelphia, with 59 deaths. A symposium on the disease was presented for city physicians at Temple University School of Medicine, September 9. Dr. John A. Kolmer discussed the virus, mode of infection, spinal fluid changes, immunity, specific prophylaxis and treatment; Dr. Ralph M. Tyson, clinical aspects of the disease, and Dr. Nathaniel W. Winkelman, therapeutic deductions from recent pathologic study.

WISCONSIN

Facilities for Treatment of Cancer.—Results of a survey of Wisconsin's facilities for treatment of cancer and recommendations for a unified program in cancer control are presented in the *Wisconsin Medical Journal* for September. This survey was made by the American Society for the Control of Cancer at the invitation of the State Medical Society of Wisconsin. It was found that in common with other sections of the United States the cancer death rate is rising in Wisconsin as the general death rate declines. From 1908 to 1930 it increased from 65.9 to 114.7 per hundred thousand. In forty-nine hospitals which reported in this survey, 2,416 cases of cancer were admitted during 1930; this represented 1.9 per cent of the total number of admissions, 122,807. Of these patients with cancer, 23 per cent died in the hospitals, a rate which emphasizes the fact that most of these were in the late stages of the disease when they reached the hospitals. Wisconsin has no hospital devoted exclusively to treatment of cancer nor is there any organized service or clinic for cancer, but all general hospitals receive and treat patients. Six hospitals were found to have equipment for roentgen treatment of a capacity of 200,000 volts and others reported apparatus of lower voltage. A total of 1,856.5 mg. of radium is being used in the state, of which 546 mg. is owned by the State of Wisconsin General Hospital at Madison. This hospital has the only radium emanation plant in the state. At the time of the survey, no active research on cancer was in progress at any of the hospitals visited. Special cancer services should be developed in the general hospital at Madison and the Milwaukee County General Hospital, Milwaukee, which would serve as teaching centers for students of the medical schools in those cities, the report recommended. Similar services were also suggested for hospitals in Eau Claire, La Crosse, Marshfield, Fond du Lac and one or more private hospitals in Milwaukee. In other sections the small number of cancer patients would make such organizations impracticable. A tripartite organization made up of the State Medical Society of Wisconsin, the state department of health and the Wisconsin Cancer Control Committee was recommended as the most effective means of achieving improved cancer service, which should include treatment for patients, education for physicians and education of the public. Other recommendations offered in the report are adequate record-keeping, medical social service for follow-up work, periodic meetings of pathologists, educational work for physicians and the public through the extension division of the University of Wisconsin, enlargement of the cancer committee of the state medical society, establishment of a cancer division in the state department of health, and enlargement of the State Cancer Control Committee operating under the auspices of the American Society for the Control of Cancer.

GENERAL

Spurious Magazine Agent.—Reports have been received by the American Medical Association that a man representing himself as an agent of the Three Pay Sales Corporation, New York, is soliciting subscriptions in California to THE JOURNAL in combination with other medical and general magazines. This man, whose name is given as F. M. Farwell, is not a representative of the Association or of the New York firm. The Three Pay Sales Corporation reports that he is wanted by police in several states and that any indorsement by him of a check made to that firm is a forgery.

Society News.—The American Society of Tropical Medicine will hold its annual meeting with the Southern Medical Association at Birmingham, Ala., November 16-18. —— The second annual meeting of the Biological Photographic Association will be held in New Haven, Conn., October 21-22. ——The twenty-second annual clinical congress of the American College of Surgeons will convene in St. Louis, October 17-21, with general headquarters at the Jefferson Hotel.——Bernard C. Roloff, former director of health education of the Chicago Department of Health, has been appointed executive secretary of the American Mouth Health Association. Dr. Thomas B. Hartzell, Minneapolis, who is also a dentist, is president of the association, which was organized in 1928.

Physicians to Address Congress.—Medical aspects of the safety movement will be discussed by physicians in a number of the sectional meetings of the National Safety Congress, which will be held in Washington, D. C., October 3-7. Dr. Albert S. Gray, Hartford, Conn., will take part in a symposium on prevention of poisoning in the chemical industry; Dr. Leroy U. Gardner, Saranac Lake, N. Y., and Dr. Albert E. Russell of the U. S. Public Health Service, with J. J. Bloomfield of the Public Health Service, Theodore Hatch and Philip Drinker, both of Harvard University School of Public Health, Boston, will present a symposium on the dust problem in industry. Among other physicians on the program are Drs. Rudolph C. Engel, Cleveland, who will speak on "Heat Effects"; Sumner M. Roberts, Boston, "Back Injuries"; Henry H. Kessler, Newark, N. J., "Sprains, Strains and Contusions (Including Hernia)"; Henry C. Marble, Boston, "Hand Injuries," and Allen G. Ireland, Trenton, N. J., "A State-Wide Safety Program."

Sir Ronald Ross Is Dead.—Newspapers have reported the death of Sir Ronald Ross, discoverer of the method of transmission of malaria by the anopheles mosquito, in London, September 16, at the age of 75. Sir Ronald was born in India in 1857 and after graduation from Saint Bartholomew's Hospital, London, in 1881, entered the Indian Medical Service. After three years' study of malaria, he commenced in 1895 a series of experiments to verify the theory advanced by Sir Patrick Manson that malaria was conveyed to man by mosquitoes. In 1897 he identified the anopheles as the carrier and traced the life cycle of the parasite in the tissues of the insect. Resigning from the Indian Medical Service in 1899, Ross became professor of tropical medicine in the University of Liverpool. In 1901 he received the Royal Medal of the Royal Society, of which he was once vice president, and the following year the Nobel Prize in medicine. He was made a Knight Commander of the Bath in 1911 and in 1918 Knight Commander of St. Michael and St. George. For some years he was physician for tropical diseases at Kings College, London, and at the founding of the Ross Institute Hospital for Tropical Diseases in 1926 he became its director in chief. During the World War he was consultant in malaria to the War Office and later consultant in malaria for the Ministry of Pensions. He served as president of the Society of Tropical Medicine and held corresponding and associate memberships in similar societies in Belgium, France, Italy and Sweden. At one time he was editor of *Science Progress*. In addition to many medical and mathematical publications, chief of which was "The Prevention of Malaria," Sir Ronald wrote philosophical poems, a novel and a volume of memoirs.

Foreign Letters

LONDON

(From Our Regular Correspondent)

Sept. 3, 1932.

Association for the Advancement of Science

The annual meeting of the British Association for the Advancement of Science was held at York. There was no meeting in the Section of Physiology, in consequence of the holding this year of the International Congress of Physiology, but many of the papers were of special interest to physicians.

PROTECTION FROM NOISE

In previous letters, the evil effects on the healthy, as well as the ill, of the greatly increased noise of our cities, principally in consequence of automobile traffic, have been mentioned. In the Engineering Section Dr. G. W. C. Kaye, superintendent of the physics department of the National Physical Laboratory, read a paper on the suppression of noise. He stated that the available processes of protection were (1) suppression of the source; (2) isolating screens or enclosures, or, alternatively, absorption; (3) arresting structure-transmitted noise by breaking the continuity in some way, or by the interposition of isolating elastic devices. Buildings had a screening value in casting sound shadows and so lessening noise transmitted in the open air. This accounted for the sylvan quietness of the gardens of the Inns of Court in London. A progressive relief from noises might be anticipated in the higher stories of buildings, though the improvement might be nullified if there were high buildings on each side of the street. An effective and inexpensive sound-baffled air inlet of inoffensive appearance which would permit windows to be opened would be of great service. Well fitting double windows of rigid construction in well separated frames with small heavy panes could be made highly effective in silencing street noises. Investigations at the National Physical Laboratory had shown that, in single walls of simple structure, sound reduction depended not on the design but almost solely on the weight per square foot, over a wide range of densities. But the present trend of building materials and structures was toward lightness and thinness, the evils of which were painfully apparent to dwellers in apartment houses and to those living in the newer houses. The solution lay in the multiple wall of two or more walls free from cross ties. Structural discontinuity was the specific for structure-borne noises. Good sound insulation was difficult where reinforced concrete was the main structural material, and this material should not be used in the construction of houses. Silent sanitary flushing would be a boon in thousands of dwellings, and in other modern buildings the sound insulation of the machinery required to operate elevators and of elevator shafts themselves was a desideratum.

Major H. F. Whimperis, director of research for the air ministry, said that there was a perfectly effective silencer for the motor cycle, which could be used without materially diminishing the speed. There was also an efficient audiometer, and he suggested that one should be kept at every police station and used on motor cycles in the presence of the owners whenever complaint was made.

Misdirected Research

It seems to be beginning to be realized that much of what is called "research," especially subsidized research, is barren of useful results. In a press interview Sir Walter Morley Fletcher, F.R.S., secretary of the Medical Research Council, says: "A great deal of the money now given by the public to finance medical research is wasted because it is earmarked for a named disease or the true method of getting the best results is ignored. The man in the street is apt to assume that if one puts money down one can buy research work. But one cannot any more than one can suddenly buy a great poem. The right conditions are obtained only after securing men with a special sort of imagination and giving them (1) the right training and opportunities, (2) a reasonably secure livelihood, and (3) intellectual freedom—they must be able to follow their own clues." It may be noted in passing that men do their best research work when young, that Darwin and Lister were sons of wealthy men, and that Newton and Faraday were attached to institutes. "Too often gifts are bestowed on isolated bodies not in a position to frame any effective or long-sighted policy, or are given for a frontal attack on a named disease. For example, immense sums have been given in the United States for cancer work, with very small result. The whole history of science shows that fruit is reaped almost always unexpectedly. If I had $5,000,000 to spend on medical research I should certainly not make a frontal attack on cancer or rheumatism (which probably causes more invalidism than any other disease) but employ it in developing particular applications of primary physiology and biochemistry, which would assuredly bear fruit later on. The new method or new clue that has helped to conquer a disease has again and again emerged from studying something else."

Sir Walter considered that there was a weak link in clinical research, which ought to become a new and leading branch of medicine. It should form part of the work of the professor of medicine in every university, but it seldom did so. In Aberdeen Prof. S. Davidson was using a concentrated serum for pneumonia and was giving his whole time to advancing his subject instead of giving it to prefessional practice. The Medical Research Council gave Sir Thomas Lewis a secure livelihood that he might devote himself to research on the heart and the vascular system. What was required was more new posts of that kind. The Rockefeller Foundation has expressed its intention of becoming financially responsible for one and the Beit trustees for another. The chairs of medicine at Oxford and Cambridge might well be occupied by men wholly engaged in this kind of research. There were many grounds for thinking that cancer was a virus disease, in which case all the elaborate work done in studying viruses would in due time find its use. The next step would be to secure immunity. A good deal of work on immunity to tumors was being done by Dr. Lumsden and others, and he thought that the whole world should at once concentrate on the task.

The Marriage of the Mentally Defective

In the annual report for 1931, just published, the lunacy board again declares that legislative action should be taken to prevent the marriage of mental defectives. The number of marriages of defectives reported to the lunacy board in 1931 was 166 (49 men and 116 women) and the number of children born as the result of marriages of defectives known to the local authorities was 103. The number of illegitimate children born to defective mothers was 177. But these are considered to be considerably under the actual figures, as few local authorities make a complete ascertainment of the number of defectives in their areas. Experience shows that it is possible to train a small number of defectives sufficiently to enable them to be returned from institutions to community care, where, if properly supervised and controlled, they can lead harmless and even useful lives, becoming partially and in a few cases wholly self supporting. But even if they can support themselves they seldom earn enough to support a wife and family. Often, when they marry, supervision and control are removed. They sink back into a state of complete dependence and too frequently become delinquent. The board has reluctantly come to the conclusion that if defectives are trained to partial self support and sent out free to marry, the community has to endure more marriages than if they had been left untrained and had become completely dependent before the marriageable age. Dealing with occupations for mental defectives, the board deplores that this country lags behind America in occupational therapy, but in the present state of public finances we cannot attempt to copy the lavish staffing of the more modern institutions of the

United States. The board finds that nothing has done more in recent years to add to the happiness and contentment of mental patients than the installation of the cinema.

PARIS

(From Our Regular Correspondent)

Aug. 17, 1932.

Immunization Against Infections Due to a Filtrable Virus

Mr. Lignières, a former student at the Pasteur Institute, who was sent to Buenos Aires to organize the bacteriologic and veterinary services of the Argentine government, has been doing research work for a long time with a view to elaborating a general method of vaccination against diseases due to a filtrable virus. The work is beset with many difficulties. Vaccination against foot and mouth disease, swine plague and cattle plague can be accomplished by injecting simultaneously under the skin (but in different parts of the body) a therapeutic serum of the disease and a minimum quantity of its virus. This method, which has the advantage of conferring a marked immunity and of being applicable at a single sitting, is not devoid of danger if it is employed in regions that are exempt, because it creates veritable foci of infection, particularly if vaccination accidents occur. Furthermore, the quantity of serum necessary makes these vaccinations rather burdensome. Mr. Lignières has elaborated a method that is based on the same principle but is much more simple and less dangerous. It consists in introducing the virus into a small area of the organism already made resistant by the serum. One avoids thus the general infection, and Mr. Lignières declares that merely the local evolution of the virus produces the immunity. His observations have had to do with swine plague, the "disease of young dogs," and foot and mouth disease, which the veterinarians are powerless to combat and which has been, in a few instances, transmitted to man. In practice, one injects the antiserum of foot and mouth disease into the skin, then under the skin of the right ear, and a little distance away one inoculates the virus diluted in glycerinated water. Similar injections are made, ten days later, into the left ear. A final inoculation is made, ten days later, with pure virus (a lethal dose for the animal). Immunity is acquired thus for several months. The virus employed must never be fully virulent. One employs virus capable of producing the disease but in small quantity, and attenuated by the length of time that it has stood, by a series of passages in another species, by the addition of an antiseptic, or by some other means. The method has given sure results with regularity. Mr. Lignières thinks that it may be employed in all diseases due to a filtrable virus, which are today numerous in the human species as well as in animals—for example, poliomyelitis, multiple sclerosis and epidemic encephalitis. Hence, this discovery may have a wide range of use.

New Apparatus for the Production of Radon

Addressing the Academy of Sciences, Professor d'Arsonval described a new apparatus that enables one to secure at once a continuous supply of radon, or emanation of radium, without the use of a solution of radium salts such as has been employed since the introduction of the Curie method, the application of which requires an extremely complicated apparatus. With the aid of his assistant Georges Vandon, Professor d'Arsonval has been doing research work on the subject, in his laboratory, since 1925. It required a long period of study, which was taken up by Vaugeois and, after his death, by Godin. It was a question of finding a stable source of radium emanation that could be substituted for the radium-bearing solution of Curie—a substance of small volume and not requiring any manipulation; a source adapting itself easily to a whole series of substances and thus making it possible to charge with radium emanation solids, liquids and many different gases, with a view to their application in therapeutics. The apparatus has now been completed. It is a simple metal tube containing a radium or a thorium salt, specially prepared in accordance with the formulas established by Vaugeois, which liberates, for a given time unit, at room temperature and without previous manipulation, the quantity of emanation for which it was constructed. The regularity and the constancy of the emission of the emanation, under these conditions, are maintained remarkably. The Vaugeois apparatus has the advantage of bringing a pure emanation, without any radium-bearing salt, in contact with the tissues. One avoids thus the destructive effects caused by the direct action of radium on the cells by reason of its long period of transformation and the difficulty of its elimination by the organism. This procedure makes radon treatment practical and eliminates all danger.

Mortality Statistics and Better Housing

The reduction in the general mortality, and particularly the mortality due to tuberculosis, in metropolitan centers, is one of the facts best established by hygienists in all countries. Nevertheless it is well that the publication of precise documents is enlightening the public on the subject, for it cannot be too well known. The *Temps* has just published a study by Pierre Bourdeix that brings on this point—as far as France and particularly Paris are concerned—a series of statistics that has awakened the interest of the physicians themselves. One interesting fact is that in Paris, where one finds crowded together, in lodgings that are not especially hygienic, a dense population, the average mortality is only 14.5 per thousand, whereas it is 18 per thousand in France as a whole, where a large part of the population lives in seemingly more healthful surroundings. In the outlying suburbs of Paris, in spite of a density of population ten times less than in Paris, and the presence of many small gardens, the mortality is higher because the housing is defective, but even in these outlying suburbs the mortality is less than in France as a whole. Possibly the author neglects to take account of important factors, namely, the better sanitary organization found in the cities, the more numerous hospital services, the abundance of physicians, and the better application of preventive methods, all of which constitute an advantage for the population—including the laboring class—of the cities, as against the habitual carelessness displayed in the homes of the peasants, in the rural districts. However, the preponderant influence of the amelioration of the housing situation is shown by the rapid diminution of the mortality of the urban working population that has been noted since it was transplanted from old insanitary quarters, demolished by order of the municipal administration, to new apartments, which are well planned. Then, too, high buildings, if they are well located, have the advantage of more sunlight and ultraviolet rays. There are in Paris many more houses (occupied by 200,000 persons) that are insanitary and are destined to be torn down. During a period of eleven years, 5,263 houses, of the 85,000 listed, supplied 38 per cent of the deaths from tuberculosis. Dr. Tellier, in scrutinizing the deaths in each of the 8,890 houses in Boulogne-sur-Mer, noted that, in the most insanitary and the most crowded houses, there were four or five times as many deaths as in the sanitary dwellings inhabited by the merchants and the well-to-do classes in general. The average mortality was 13 per thousand, or 5 per thousand in the homes of the rich, and from 18 to 20 per thousand in the overcrowded quarters of the laboring classes. Pierre Bourdeix concludes that the French government would be engaging in an excellent business enterprise if it would expend much larger sums for the amelioration of the housing of the underprivileged classes. The saving in hospital and sanatorium costs would more than make up for the additional expenditure of municipal funds. If the general mortality of France should be reduced by such means from its present rate of 18 per thousand to 11 per thousand, which is the average of the neighboring countries, the country would save 250,000 human lives and its population would then show an increase, for its birth rate is constant and tends to show a slight increase, whereas its loss of population

results chiefly from its high death rate. Bourdeix cited the example of eight cities of the Netherlands in which the mortality has dropped to 8.5 per thousand; fifty Swiss cities with a mortality of 9.5 per thousand; fifty German cities with a mortality of 10.1 per thousand (with a minimum of 7.7 in Frankfort-on-Main); 107 English cities with a mortality of 11.5, and eighty-one cities of the United States with a mortality of 11.9. In Paris, with an average mortality of 14.5 per thousand, two groups of reasonably priced, healthful apartment houses, designed for workmen and employees, and erected by two philanthropists, presented a mortality of 9.2 and 7.6 per thousand, respectively.

BERLIN

(From Our Regular Correspondent)

Aug. 15, 1932.

Heredity and the Choice of a Vocation

The vocational consultation centers face a difficult problem, for it is by no means simple to determine whether an examinee possesses a high degree of aptitude for a definite vocation. The more exactly the tests of adaptability can be carried out, the easier it is to escape the charge of "examination chicanery," which even for simple callings demands the possession of high requirements and a high degree of scholarship. Dr. v. Behr-Pinnow, writing in the *Deutsche medizinische Wochenschrift* on "Heredity and Choice of a Vocation," calls attention to the fact that research has brought out many points concerning the hereditary factors connected with intellectual endowment. Thus, a comparison of the school reports of a large number of children has established that the marks or grades of parents and offspring agree to a marked extent, and that even grandchildren present in their school performances much the same results as the grandparents. Investigations in orphan asylums, in which the environment of all pupils is practically the same, have shown a high degree of similarity in the intelligence displayed by brothers and sisters. This was proved also by an experiment. A group of about twenty children taken from the lowest classes of a metropolitan population and ranging around 1 year of age (that is to say, at an age when they were entirely unconscious of their environment) was placed in an isolated children's home under excellent management. Nevertheless, at the age of 6, in all children except one, the inherited bad traits manifested themselves, so that the experiment had to be given up, as it promised no results. In a group consisting of many thousand children belonging to all classes of society, it was shown that the best results are secured with the offspring of persons possessing a university training, while the worst results were observed in the offspring of workmen with an elementary education.

According to a definite computation, the child of a professor, a large industrialist or the head of a large commercial enterprise has at least a thousand times better chance of possessing the degree of intellectual endowment demanded of him than the child of a workman with an elementary education. It is difficult to demonstrate the hereditary transmission of intelligence in a matter of detail. The general intelligence of the child is a mixture of many good aptitudes, and for the various vocations and occupations it is essential to be familiar with the hereditary transmission of individual intellectual gifts or endowments. In the hereditary transmission of a talent for music, which appears most prominently in the families of great musicians, five or ten, or even twenty, individual factors have been distinguished. The hereditary transmission of a talent for drawing was likewise studied in several family trees. It has been found easier to determine and measure the intellectual endowments of males than of females, since women, until recently, did not often have an opportunity to develop and use their aptitudes and talents. An aptitude for teaching based on actual experience is often handed down in a family from one generation to another, and there can be no doubt that pedagogic talent may be increased from generation to generation as the result of its practical use. Dr. v. Behr-Pinnow studied, in the families of the old Bavarian town of Mittenwald, which had long been devoted to violin making, the frequent hereditary transmission of a whole complex of occupational aptitudes. That in many cases environmental influences do not alone decide the choice of a vocation may be seen from the fact that the descendants of the Mittenwald violin makers hold fast to their old occupation when they have left their native town, and that the making of instruments is still pursued in spite of the bad conditions prevailing at present. To be sure, in the study of hereditary influences in the choice of a vocation, occasional representatives of entirely different vocations are found, but that can be easily explained by the fact that the hereditary germinal factors in the various generations are seldom exactly alike, since new factors are constantly being brought in by the mother, so that the combined hereditary influence may point in the direction of a different vocation. Furthermore, the offspring from families with versatile talents may of course be well fitted for some other vocation than that of their forebears. They may, in fact, take up entirely new occupations, as for example that of chauffeur. Nevertheless, the hereditary aptitude is likely to break through again and again. In the choice of a vocation, therefore, the factor of heredity must be considered more than has been the case in the past. It is thus the duty of parents to keep a written record of the family history, recording the occupations of the ancestors on the father's side and on the mother's side, including the occupations of near relatives. In school, each child before graduation should be required to write an essay on the subject "The Occupations Followed and the Talents or Aptitudes Displayed by Members of My Family," which, together with the health record card showing the hereditary aptitudes, would be of great value in connection with an examination to aid in deciding on one's vocation in life. Persons in charge of the examination and selection of candidates for given employments should make precise investigations in order to determine what aptitudes are required for a given vocation or employment.

The Importance of Laparoscopy

Addressing the Berliner Medizinische Gesellschaft, Dr. Kalk, chief physician of the von Bergmann University Clinic in the Charité Hospital, gave an account of the method he employs to make visible the organs of the abdominal cavity in a living person. Air is first injected into the abdominal cavity through a slender cannula, and the abdominal cavity is then examined through a cystoscope-like instrument. This laparoscope consists of a lancet-like trocar, which is inserted in the abdominal wall following the application of anesthesia. The lamp carrier is introduced into the trocar with the necessary optical instruments, which enables the examiner to get a picture of the adjacent organs. Kalk has used this method in 250 cases. He exhibited a number of pictures which were so clear that the organs could be seen as distinctly as if they were lying on the dissecting table, with the added value that the pictures were lifelike.

The method has doubtless its chief value in the diagnosis of liver conditions and of disorders of the peritoneum. In cases of liver disorder, in which the clinical diagnosis is usually difficult, the method will often clarify the situation rapidly. Kalk demonstrated further the diagnostic possibilities in diseases of the gallbladder, stomach, spleen, the small and large intestine, and for tumors within the abdominal cavity. Also for the clarification of scientific questions—for example, the motility of the abdominal organs and the action on the circulation effected by drugs—laparoscopy is a valuable method.

If a region is properly anesthetized and the examiner understands and applies properly the technic, the method is entirely painless and without danger. The method, to be sure, should not be employed until all other clinical and roentgenologic methods of research have failed to establish a diagnosis. These observations were confirmed by Dr. Stoltze of Frankfort-on-Main, who has employed the Kalk method at the Schmieden

university surgical clinic in Frankfort-on-Main. The method is especially valuable for the surgeon in deciding the question as to whether in certain disorders, produced by adhesions of the abdominal organs, an operation is necessary.

Consultations over the Telephone

The general economic crisis has had the effect of reducing the number of calls received by physicians, so that nearly all physicians have suffered a great reduction in their practice, and not only in their private practice but also in their panel practice, because of the decrease in the membership of the *krankenkassen* resulting from unemployment. The physicians, however, like members of other professions, have to accommodate themselves to existing conditions. It goes without saying that physicians have in many cases reduced their fees to fit the straitened circumstances of their clients. But, in spite of such needful and reasonable adaptation, certain vexatious problems have recently come to the fore that are disturbing the relations of physician and patient. Persons who, to judge from their clothing, their vacation travels, their automobile and their general mode of living, are in good circumstances, seek to secure reductions of medical fees and allow their physician to wait several months for his compensation. They seem to forget that the physician, under present conditions, is in greater need than ever of prompt payment for his laborious services, and that he too must pay punctually his rent, his taxes and other obligations. In recent years, a new cause of difficulty and misunderstanding has arisen owing to the fact that some patients never consult their physician other than over the telephone, and, after receiving some preliminary advice, neglect to call the physician in person, thinking that the physician will then overlook the matter and neglect to make any charge. That is a fundamental error, for it is definitely provided in the official fee schedule of physicians that a telephone consultation shall be charged for just the same as a personal visit. The physician is entitled to render a bill for such a service, and in the cases in which the patient was evidently trying to avoid the payment of the regular fee, it is his plain duty to do so.

The Atmosphere of Large Cities in Relation to Ultraviolet Rays

The vapors contained in the air in large cities are often held responsible for the poor transmission of ultraviolet rays. To ascertain the degree of truth in the assertion, Dr. F. Ellinger recently carried out experiments on the roof of the Institut für Strahlenforschung and also at the meteorological observatory in Potsdam. This observatory offered practically rural conditions, whereas the Berlin institute, located between two railway stations in the center of the city, presented the most unfavorable conditions imaginable. Nevertheless it was found that in Berlin, under the most unfavorable radiation conditions, the reduction of the intensity of the ultraviolet radiation, as compared with the values established in Potsdam, amounted to only 10 to 15 per cent. For the transmission of ultraviolet rays in large cities the skyshine is no less important than the direct solar radiation; in fact, in the winter months it exceeds, many times over, the direct radiation of the sun, while in summer it is of approximately equal value. Of greater significance is the fact that, at the Berlin institute, under the most favorable sun conditions, the intensity of the ultraviolet rays below in the court was only 10 per cent of the intensity of the rays established on the top of the building. The shady street, the gloomy court and dark rooms, together with the diet poor in vitamins, are the cause of the pale faces of city dwellers and the prevalence of rickets among their offspring. Ellinger recommends, as a means of obviating the condition, the more general introduction of roof gardens, the use of more suitable building material in the fronts of apartment houses, organized hikes of children in the parks or green fields, and the provision of sandpiles for children's play, as sand has a marked capacity to reflect ultraviolet rays. Ten minutes play outdoors in the sun will make up, in a general way, for the dearth of light during the hours in the schoolroom. The so much despised sandy regions near Berlin, with their many rivulets, offer especially favorable opportunities for exposing the body to intensive ultraviolet radiation. Overexposure to the sun's rays produces, however, a thickening of the horny layer of the skin, which impedes the passage of the ultraviolet rays into the deeper tissues of the body; hence, exaggerated exposure to solar radiation should be avoided. Treatment with artificial ultraviolet radiation, however, should not, Ellinger emphasizes, be undertaken by the public. He demands that light therapy be placed entirely in the hands of the physician and that lay treatment be prohibited because of the dangers.

Hygiene as a Subject in the Training of Teachers

The federal commission for promotion of the knowledge of hygiene among the people has published a report of its activity during 1930 and 1931. It appears that the bad effects of the existing economic conditions may be seen in the work of the federal commission and of the subcommittees set up in the various *länder* and provinces. But, in spite of the many difficulties that have arisen, the commission has done meritorious work. Special attention was given in these two years to the promotion of hygienic knowledge in schools, and especially to the training of the oncoming generation of teachers. That training has been assured by making hygiene a required subject in most institutions devoted to the training of teachers. For the supplementary training of teachers already on active duty, continuation courses in hygiene have been widely provided, considerable sums in aid of such courses having been provided by the federal ministry of the interior with the expectation that the various *länder* would furnish like amounts. In this manner it was possible to hold about a hundred continuation courses. The exhibit in the Gesundheitshaus Kreuzberg in Berlin ("The Development of the German Public Health Service") was utilized for the instruction of large numbers of teachers. Plays with a hygienic moral were organized in the Kasperle Theater and proved an effective means of instructing the oncoming generation of children. Great value was attached also to the use of publicity films dealing with hygienic subjects, and the federal commission prepared also an interesting series of films termed "Lustige Hygiene." For a number of years, attempts have been made to introduce informative lectures on hygiene especially adapted for the unemployed. Karlsruhe particularly has been successful in this respect.

The federal commission has also published a number of instructive books; for example, a compendium on "Care of the Health," "Hygienic Facts Not So Well Known," and "What Shall I Cook Tomorrow? Hints on How to Prepare Wholesome, Economical Food, with Sufficient Variety."

The Leprosy Scare in Berlin

For some time past, rumors have been afloat in Berlin that children had contracted leprosy following the eating of bananas; a number of children were even said to have been transported by airplane to a remote island. Although these rumors did not bear the mark of plausibility, and health officers had already declared that the statements were preposterous, nevertheless the public health service instituted inquiries as to the alleged cases of leprosy and did not find the slightest evidence to justify the rumors. It has been many years since a case of leprosy has actually developed in Berlin.

A similar rumor spread, a few years ago—likewise during dog days, or the period of the greatest summer heat. At that time it was alleged that children who had been playing on a carpet imported from the orient had developed leprosy. An investigation showed that the rumor was without foundation. In spite of these events, a new leprosy scare will doubtless occur every summer, notwithstanding the fact that throughout the year only two cases (brought in from outside) were notified.

BELGIUM

(From Our Regular Correspondent)

Aug. 18, 1932.

Life Insurance for Physicians

The executive committee of the Fédération médicale belge has launched a system of life insurance whereby the resolution passed by the last Congress of Professional Medicine will find at least partial realization. The present collective contract, when it is signed, will provide life insurance for all physicians who have been members of the federation for at least six months, irrespective of their present age. On every anniversary date of the present collective contract, new members of the federation who have been enrolled for at least six months may, on written request, become participants in the plan of insurance, provided that on the first anniversary the age of such applicants does not exceed 60 years, on the second anniversary 55 years, and on the third anniversary 45 years, it being understood that they may continue then the insurance until their death. The physicians who do not take out insurance at the time the collective contract is signed, or after they have been members of the federation for six months, can be insured only after passing a satisfactory medical examination. The company assumes all risks of death, with certain reservations provided by law or specified hereinafter:

1. If the insured dies as the result of suicide, unless the suicidal act occurs while he is unconscious, the company will be absolved from payment of the claim unless the policy of the insured dates back two years before his suicide.

2. If the insured goes to intertropical countries, he must pay an additional premium amounting to 1 per cent of the fixed death benefit. If, however, six months has elapsed since the insured entered into his contract, the company will assume without additional premium and without previous notice all the risks involved by the journey in any part of the world.

3. The company will not assume the risks of aviation other than for passengers traveling on the regular lines of recognized common carriers. Nevertheless, it will assume in time of peace the risks of aviation and of airports as affecting soldiers of the reserve forces while under direct command.

4. In case of war with a foreign power, the policy will remain in force for insured persons who are not mobilized, provided the premiums are regularly paid. But once the insured has been mobilized his policy will be suspended as of that date, and the company will reimburse the policyholder for any unearned part of the last premium paid. In case a physician shall cease to practice his profession for any other cause than total or permanent disability, his insurance will not be invalidated provided he remains a member of the federation.

Lead Poisoning Due to Snuff

Addressing recently the Royal Academy of Medicine of Belgium, Mr. Le Fèvre de Arric reported five cases of lead poisoning resulting from the use of snuff. These five patients showed signs of a saturnine anemia and other untoward conditions: hepatic cirrhosis in one case, paralysis of the forearm, and toxic meningitis, with a cachectic state, resulting in death in one case. An inquiry revealed no possible mechanism of lead poisoning other than that of snuff, which was used by all patients and which had been purchased in packages wrapped with lead foil for its better preservation. An analysis demonstrated frankly the presence of considerable amounts of lead in the snuff. The continual use of this snuff easily explained the untoward conditions observed by the author.

The presentation of the communication was followed by a discussion in which Mr. Schoofs stated that researches that he had had made in the province of Liége had led him to conclude that lead foil may be justly incriminated. Mr. d'Hollander recalled a case similar to those described by Mr. Le Fèvre de Arric. Mr. Lemaire confirmed the accuracy of the statements, calling attention to the fact that analyses of snuff wrapped in lead foil, as carried out by Mr. Castelle, revealed the presence of traces of lead in the snuff.

Instruction on Alcoholism

The minister of public instruction has decided that, in the public schools, from ten to twelve periods one-half hour in length shall be devoted every year to teaching the evils of alcoholism.

Abnormal Children

The Société protectrice de l'enfance anormale in Antwerp held an extraordinary session on the occasion of the thirtieth anniversary of its foundation, at which the following conclusions were adopted:

1. The collaboration of physicians and teachers should be more effective in the study of familial antecedents, the present condition and the individual management of unusual and abnormal children. The local conditions of such preliminary cooperation should be established on the basis of trials made in the more apparent cases.

2. The training schools for teachers should provide at least elementary instruction in the problem of adapting teaching methods to defective or unusual children. The authorities should organize a special course of instruction, comprising a year of study and open to members of the instructional corps who have had at least five years of experience in classes of normal children.

3. Classes should be organized in Belgium for pupils whose weak vision necessitates the use of special methods of instruction, with the understanding that the organization of such classes shall not entail any additional expense.

4. The obligation of giving abnormal children an education should be recognized and their progress should be carefully controlled. Abnormal children must be discovered in their early years and to that end the sanitary record card should be made universal.

5. The law of May 15, 1912, should be amended so as to extend the competence of the judge to children 18 years old. The preventive measures of organizations for the protection of children should be encouraged so as to inure to the benefit of abandoned children, children of divorced parents, and those deprived of paternal authority. At the request of these organizations, the judge of the juvenile court shall adopt measures to insure the education of these minors.

6. Provision should be made, through the judges of the juvenile court, for a better application of the protection of children in case of divorce or separation of the parents.

8. Court actions to deprive parents of the care of their children should be tried before a judge of the juvenile court.

9. The legislature should pass a law concerning crimes committed by adolescents and should incorporate the following principles: (*a*) The system of probation should be introduced; (*b*) a judge should be appointed who is familiar with the application of the principle of probation, and (*c*) the indeterminate sentence, with a minimum and a maximum term, should be adopted.

Health in the Congo

The annual report on the administration of the Belgian Congo for the year 1929 has just appeared. The mortality among Europeans has declined to 11.09 per thousand, as against 13.53 and 14.73 in 1928 and 1927, respectively. The number of natives hospitalized was 41,035, with 3,008 deaths, or 7.3 per cent of the total number of deaths. These figures do not include trypanosomiasis, 27,046 new cases of which were discovered. Syphilis, though stationary among the Europeans, appears to be increasing among the natives in the large centers and along the paths of communication. Pneumonia remains a grave disease among the natives, 4,356 cases having been hospitalized in 1927, resulting in 931 deaths, or a mortality of 21.4 per cent. Children's aid societies are developing rapidly.

Marriages

CHARLES E. FRANKLIN to Miss Elva Ruth Erlenborn, both of Oak Park, Ill., at Indianapolis, September 6.

OVID O. MEYER, Stevens Point, Wis., to Miss Lyda Anne Henry of Guntersville, Ala., in Boston, recently.

CHARLES LE ROY SWINDELL, Ocracoke, N. C., to Miss Virginia Thornton at Beaufort, June 14.

GAMBER FREDERICK TEGTMEYER to Miss Margaret Louise Brown, both of Milwaukee, June 18.

PETER G. PITCHIOS, Chicago, Ill., to Miss Harriet S. Georgacakis of Cicero, Ill., July 31.

HOWARD J. KENNEY, Delavan, Wis., to Miss Gertrude Lierick of Milwaukee, June 8.

JOHN L. WILLIAMS to Miss Lila Gay Cochran, both of Tallahassee, Fla., July 28.

OREN L. KIRKLIN, Muncie, Ind., to Miss Eleanor Judd of Rochester, Minn., July 2.

CHARLES J. HUTTON, Atlanta, Ill., to Miss Edith Mae Robinson of Lincoln, June 15.

HUGH G. BRIDEGROOM, Evanston, Ill., to Miss Mary Dunbar of Wheaton, June 11.

Deaths

Russell Aubra Hibbs ⊕ New York; University of Louisville (Ky.) School of Medicine, 1890; chairman of the Section on Orthopedic Surgery, American Medical Association, 1915-1916; professor of orthopedic surgery, Columbia University College of Physicians and Surgeons; member of the American Orthopedic Association and the Associated Anesthetists of the United States and Canada; fellow of the American College of Surgeons; surgeon in chief at the New York Orthopedic Dispensary and Hospital; consulting orthopedic surgeon to the Presbyterian and French hospitals, New York Infirmary for Women and Children; consulting surgeon to the Colored Orphan Asylum and the Sea View Hospital; widely known for introducing methods of performing fusion operations on the spinal column, on the hip, the knee and the ankle; for the invention of a table for the reduction of congenital dislocation of the hip; also as a teacher of orthopedic surgeons; author of numerous articles on scoliosis and tuberculosis of the bones; aged 63; died, September 16.

Moses Allen Starr ⊕ New York; College of Physicians and Surgeons in the City of New York, 1880; lecturer on diseases of the nervous system, 1887-1889, professor, 1889-1900, professor of neurology, 1903-1915, and since 1915 emeritus professor at his alma mater; member and past president of the American Neurological Association; member of the Association for Research in Nervous and Mental Diseases; author of "Familiar Forms of Nervous Diseases"; "Brain Surgery"; "Atlas of Nerve Cells" and "Nervous Diseases, Organic and Functional"; aged 78; died, September 4, in Marienbad, Germany.

Francis Eastman Locy ⊕ Surgeon, Lieutenant Commander, U. S. Navy; Northwestern University Medical School, Chicago, 1915; entered the Navy in 1917; fellow of the American College of Surgeons; served during the World War; formerly surgeon in charge of the ear, nose and throat department, First Brigade Hospital, Port au Prince, Haiti; aged 42; died, August 28, in the United States Naval Hospital, Philadelphia, of septicemia.

Anthony Hart Harrigan ⊕ New York; Columbia University College of Physicians and Surgeons, New York, 1905; member of the Associated Anesthetists of the United States and Canada and fellow of the American College of Surgeons; attending surgeon to the Fordham, St. Francis and Misericordia hospitals; aged 50; died, August 13, in the New York Post-Graduate Hospital, of cerebral hemorrhage.

Harry Kalman Loew ⊕ Brownsville, Texas; Columbia University College of Physicians and Surgeons, New York, 1902; past president and secretary of the Cameron County Medical Society; fellow of the American College of Surgeons; served during the World War; health officer of Brownsville; on the staff of the Mercy Hospital; aged 53; died, August 3, of a hemolytic streptococcus infection.

Ray Carrington Blankinship ⊕ Madison, Wis.; Medical College of Virginia, Richmond, 1914; associate professor of clinical medicine, University of Wisconsin Medical School; served during the World War; fellow of the American College of Physicians; on the staff of the Madison General Hospital; aged 42; died, August 23, of heart disease.

Robert Trout Comly, Philadelphia; University of Pennsylvania School of Medicine, Philadelphia, 1930; on the staff of St. Christopher's Hospital for Children; aged 26; died, August 25, of injuries received when he jumped from the roof of the nine story Martin Maloney Memorial Clinic of the University of Pennsylvania.

Abraham Solomon Troupin ⊕ Boston; Tufts College Medical School, Boston, 1918; instructor in obstetrics at his alma mater; on the staffs of the Boston City, Evangeline Booth and Beth Israel hospitals; aged 39; died suddenly, August 14, at his summer home in Kenberma, Mass., of heart disease.

Herbert Respess, Macon, Ga.; Vanderbilt University School of Medicine, Nashville, Tenn., 1906; member of the Medical Association of Georgia; served during the World War; formerly on the staff of the Oglethorpe Private Infirmary; aged 52; died, August 6, of heart disease.

John Duke Kilgore, Minden, La.; Memphis (Tenn.) Hospital Medical College, 1910; member of the Louisiana State Medical Society; aged 50; on the staff of the Minden Sanitarium, where he died, July 27, as the result of injuries received in an automobile accident several weeks ago.

Ralph Jacobson, New York; University and Bellevue Hospital Medical College, 1925; member of the Medical Society of the State of New York; aged 30; died, August 6, in the Jewish Memorial Hospital, of burns received when an alcohol lamp exploded in his office.

Charles F. Lehlbach, Newark, N. J.; College of Physicians and Surgeons in the City of New York, 1888; member of the Medical Society of New Jersey; aged 65; died, September 3, at Summit, of chronic interstitial nephritis and pulmonary tuberculosis.

Gregory Natanson, Brooklyn; Albertus-Universität Medizinische Fakultät, Königsberg, Prussia, 1886; University of Vienna Faculty of Medicine, Vienna, Austria, 1889; aged 73; died, August 8, in the Brownsville and East New York Hospital, of uremia.

William A. Nicholson ⊕ Franklin, Pa.; University of Michigan Medical School, Ann Arbor, 1871; Bellevue Hospital Medical College, New York, 1876; aged 82; died, July 10, in the Cleveland (Ohio) Clinic Hospital, of uremia and bronchopneumonia.

Arthur Goss Kilbourn, Groton, Mass.; Harvard University Medical School, Boston, 1902; member of the Massachusetts Medical Society; medical director and owner of the Groton General Hospital; aged 56; died suddenly, August 4, of heart disease.

Charles Henry Magee, Burlington, Iowa; Missouri Medical College, St. Louis, 1889; University of Pennsylvania School of Medicine, Philadelphia, 1891; member of the Iowa State Medical Society; aged 72; died, August 7, of pernicious anemia.

Emil Henry Hermann, Hillsboro, Ill.; St. Louis University School of Medicine, 1906; member of the Associated Anesthetists of the United States and Canada; aged 48; died, July 16, of coronary thrombosis.

Henry W. Johnson, Riegelsville, Pa.; Jefferson Medical College of Philadelphia, 1883; aged 73; died, August 6, in the Easton (Pa.) Hospital, of carcinoma of the prostate and postoperative pulmonary embolus.

John Murphy, Loretto, Pa.; Hahnemann Medical College and Hospital, Chicago, 1878; for many years member of the school board; physician to St. Francis College; aged 76; died, July 8, of uremia.

Carl Otto Imoberstag, Toledo, Ohio; Toledo Medical College, 1902; member of the Ohio State Medical Association; on the staff of St. Vincent's Hospital; aged 54; died, August 10, of pneumonia.

John Frank Adams ⊕ Crossville, Ill.; Hahnemann Medical College and Hospital, Chicago, 1896; aged 61; died, August 23, in the Carmi (Ill.) Hospital, of an overdose of morphine, self-administered.

Nathaniel Welch Hicks, Florence, S. C.; Medical College of the State of South Carolina, Charleston, 1898; for twenty years chairman of the school board; aged 54; died, August 5, of heart disease.

Herbert Charles Blume, El Monte, Calif.; St. Louis University School of Medicine, 1929; aged 29; died, August 7, in a hospital at Los Angeles, of injuries received in an automobile accident.

Henry B. Shmookler ✠ Philadelphia; Jefferson Medical College of Philadelphia, 1897; medical director of the Mount Sinai Hospital; aged 56; was killed, August 11, in an automobile accident.

J. William Clarke, Owensboro, Ky.; Hospital College of Medicine, Medical Department Central University of Kentucky, Louisville, 1889; aged 73; died, August 13, of cerebral hemorrhage.

Michael J. Kenefick ✠ Algona, Iowa; Rush Medical College, Chicago, 1892; past president of the Iowa State Medical Society; on the staff of the Kossuth Hospital; aged 70; died, August 6.

John Manning Holcombe, Belton, S. C.; Medical College of the State of South Carolina, Charleston, 1878; member of the South Carolina Medical Association; aged 77; died, July 30, of colitis.

Henry Lawrence Martin ✠ Kansas City, Mo.; University of Nashville (Tenn.) Medical Department, 1898; aged 67; died, July 28, in St. Mary's Hospital, of carcinoma of the lung.

Allan Buchner Cook, Toronto, Ont., Canada; University of Toronto Faculty of Medicine, 1875; Faculty of Medicine of Trinity College, Toronto, 1881; aged 77; died in July.

James Joseph Teas, Waverly, Tenn.; Medical Department, University of Tennessee, Nashville, 1888; aged 67; died, July 23, of cerebral hemorrhage.

D. T. Nash, Lovejoys Station, Ga.; University of Louisville (Ky.) School of Medicine, 1876; aged 81; died, April 28, of obstruction of the esophagus.

Henry Wellington Langstaff ✠ Colfax, Ill.; Hahnemann Medical College and Hospital, Chicago, 1885; aged 76; died, July 20, of cerebral thrombosis.

Thomas C. Hammond, Platte City, Mo.; Jefferson Medical College of Philadelphia, 1869; aged 86; died, July 18, of cerebral arteriosclerosis.

John Franklin James, Sarnia, Ont., Canada; Western University Faculty of Medicine, London, 1895; aged 65; died, June 30, in Strathroy.

Thomas C. Marion, Gillespie, Ill.; College of Physicians and Surgeons, Keokuk, Iowa, 1886; aged 87; died, June 27, of arteriosclerosis.

Elmer E. Flickinger, Beverly Hills, Calif.; Homeopathic Hospital College, Cleveland, 1885; aged 72; died, May 18, of heart disease.

N. L. Grant, La Grange, Ga.; University of Georgia Medical Department, Augusta, 1904; aged 57; died, July 23, of heart disease.

Harris Bernhard Adler, New York; Northwestern Medical College, St. Joseph, Mo., 1885; aged 71; died in July of heart disease.

Ranson Wood Myers, Fullers, N. C.; Chattanooga (Tenn.) Medical College, 1897; aged 69; died, August 8, of cerebral hemorrhage.

Isaiah M. Owens, Owensville, Mo.; Barnes Medical College, St. Louis, 1897; aged 64; died, June 19, of pulmonary tuberculosis.

Wakefield Fenton, Los Angeles; nongraduate; aged 84; died, May 4, of arteriosclerosis, chronic myocarditis and gangrene.

James Donald, Cowley, Alta., Canada; University of Glasgow Medical Faculty, Glasgow, Scotland, 1881; aged 71; died, May 14.

Leonard F. Case, Los Angeles; Philadelphia University of Medicine and Surgery, 1871; aged 100; died, April 9, of senility.

Samuel James Baker, Madisonville, Ky.; University of Louisville School of Medicine, 1892; aged 59; died, June 11.

Lewis C. Lukenbill, Marco, Ind.; Hospital College of Medicine, Louisville, 1897; aged 64; died, July 16, of pneumonia.

George W. Pattee, Janesville, Wis.; Chicago Medical College, 1870; aged 92; died, July 14, of bronchitis and myocarditis.

Joseph A. Windsor, New Richmond, Ohio (licensed in Ohio in 1896); aged 82; died, July 24, of chronic nephritis.

Amos Longfellow Baker, Kasson, Minn.; Rush Medical College, Chicago, 1887; aged 80; died, July 20, of senility.

Warren C. Hemphill, Wattensaw, Ark. (licensed, Arkansas, 1903); aged 73; died, July 23, of cerebral hemorrhage.

John C. Beebe, Houston, Texas; Toledo Medical College, 1888; aged 88; died, June 23, of carcinoma of the face.

George E. Paul, Granville, N. Y.; Albany Medical College, 1869; aged 87; died, June 18, of heart disease.

Bureau of Investigation

NACOR

Another Iodide Mixture Sold as a "Cure" for Asthma, Bronchitis and Chronic Coughs

"Nacor" is marketed by the Nacor Medicine Company of Indianapolis. According to information received, the president and treasurer of the Nacor Medicine Company is one M. L. Haymann, while the vice-president and secretary of the company is the wife of M. L. Haymann, who, however, is said to take no active part in the business. The directors of the concern are Haymann and his wife, together with a man who is an accountant and two men who are said to be connected with a printing concern. It is worth noting that in exploiting medicines to be sold to the public on the mail-order plan, it is much more necessary to know something about the printing and advertising business than it is to know anything about medicine, pharmacy or chemistry. None of those connected with the Nacor Medicine Company, so far as we have been able to learn, has any knowledge of medicine or pharmacy.

The Nacor Medicine Company was incorporated under Indiana laws in 1916, but apparently was quite inactive until 1923, at which time the capital stock was increased from $1,000 to $50,000. While it is true that M. L. Haymann had no medical training, he has nevertheless had previous training in mail-order quackery. Some years ago, he was connected with a crude consumption-cure fake, sold on the mail-order plan, known as "Nature's Creation."

As many of the readers of this department of THE JOURNAL may remember, Nature's Creation was dealt with extensively in the issues of March 5, 1910; February 4, 1911, and March 30, 1912. Nature's Creation was said to have been the "discovery" of Mrs. J. M. Reynolds, reported to have been a fortune teller in a Chicago basement. The Reynolds woman, together with one H. W. Campbell, put Nature's Creation on the market first from Chicago as an absolute cure for syphilis and, later, from Columbus, Ohio, as a cure for tuberculosis. The preparation was analyzed in the A. M. A. Chemical Laboratory and found to be a solution of potassium iodide in alcohol and water, with vegetable extractives and flavoring. The Bureau of Investigation first exposed it as a fraud in 1910. Later, as the thing continued to flourish, alleged cures were investigated and a long and gruesome list of persons who had died after taking the stuff was published.

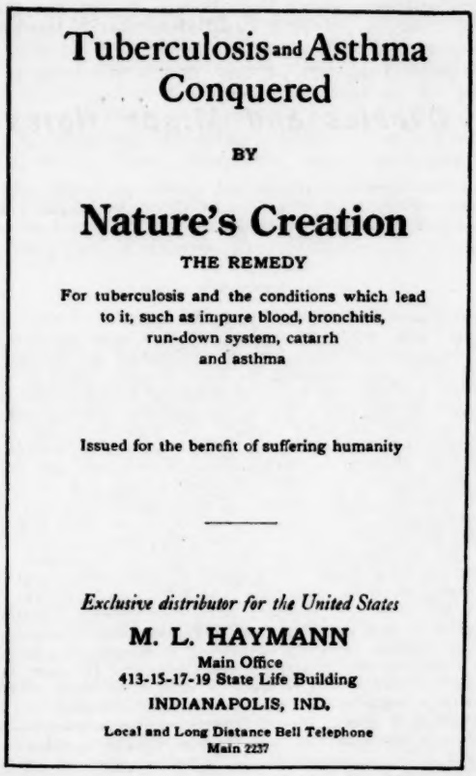
In due time, the Reynolds woman and Campbell disagreed and Campbell filed suit against the woman to recover $28,000 of which, he alleged, she had defrauded him. In his petition, Campbell declared that Nature's Creation, which sold for $5 a bottle, cost 24 cents a bottle to make! Campbell further declared that believing the stock in the company had depreciated from $1.00 to ten cents a share, he sold it at the low rate, later to learn, according to his petition, that the stock was actually still worth $1.00 and that Mrs. Reynolds had been the one who, unknown to him, had purchased his stock at ten cents a share!

In 1918, the United States Department of Agriculture declared that the claims made for Nature's Creation were false and fraudulent; in 1925, the Post Office Department declared Nature's Creation a fraud and debarred the stuff from the mails.

Some time after the falling-out of Mrs. Reynolds and Campbell, Milton L. Haymann (the present exploiter of Nacor) was the exclusive distributor of Nature's Creation, with offices in the State Life Building (where he still is), Indianapolis. Haymann issued a booklet on Nature's Creation declaring that tuberculosis had been "conquered."

Today, Milton L. Haymann is still selling a "patent medicine," but doubtless experience has taught him that it is expensive and risky to sell it as a "cure" for consumption—at least directly. Nacor is featured as a remedy for asthma and bronchitis with a good deal of stress laid on its alleged value in "chronic coughs." In a booklet of Nacor testimonials one reads of individuals whose alleged clinical symptoms savor

strongly of tuberculosis. One woman declares that she had a cough and did not think that she would live to see her next birthday, but that Nacor cured her. A man declares that his son, following a severe attack of influenza, coughed nearly all the time and lost weight and "nothing seemed to do him any good" until he took Nacor, which caused him to get well. A mother writes that her daughter had a bad cough following an attack of influenza, that she lost appetite and weight, and was



Tuberculosis and Asthma Conquered

BY

Nature's Creation

THE REMEDY

For tuberculosis and the conditions which lead to it, such as impure blood, bronchitis, run-down system, catarrh and asthma

Issued for the benefit of suffering humanity

Exclusive distributor for the United States

M. L. HAYMANN

Main Office
413-15-17-19 State Life Building
INDIANAPOLIS, IND.

Local and Long Distance Bell Telephone
Main 2237

Photographic reproduction (reduced) of the cover of a booklet issued by M. L. Haymann at the time he was "exclusive distributor" of the fraudulent "consumption cure" Nature's Creation, which was essentially a solution of potassium iodide in alcohol and water.

in such a bad condition that it was not thought that she would recover: But Nacor cured her! Another parent reports that his three-year-old daughter, who had had pneumonia, was left with a very bad cough and was so weak that she could not stand. Here, again, Nacor was alleged to have cured her! In yet another case, a woman testifies that she had a bad cough following a cold and that her people thought she "could last only a short time," while the doctor had told her that the only thing to do was to change climate. She "dragged along, weak and discouraged, for several years," then finally, using Nacor, recovered! A man testifies that he was bedfast, weak and "coughing considerably," but by taking Nacor, he did not have to change climate.

These are just a few of the testimonials for Nacor through which, by innuendo or implication, the tuberculous may be led to believe that Nacor is a remedy for that condition. Because of the large number of inquiries received regarding this preparation and the wide extent to which the stuff is advertised, the A. M. A. Chemical Laboratory was asked to make an analysis of Nacor. The Laboratory report follows:

LABORATORY REPORT

"One original package of Nacor (The Nacor Medicine Co., Indianapolis, Ind.) was submitted to the A. M. A. Chemical Laboratory by the Bureau of Investigation. The package consisted of a bottle of liquid labeled 'Nacor' and some tablets in an envelope which bore directions for taking.

"Nacor Liquid:—The label on the bottle stated that the preparation contained 6 per cent alcohol and bore the following dosage statement: 'One-half Teaspoonful or more in Water After Meals.' The directions on the back of the bottle were slightly different: 'Take 3 times a day (immediately after meals) in ¼ glass of water. For adults start with ½ teaspoonful and gradually increase to one.'

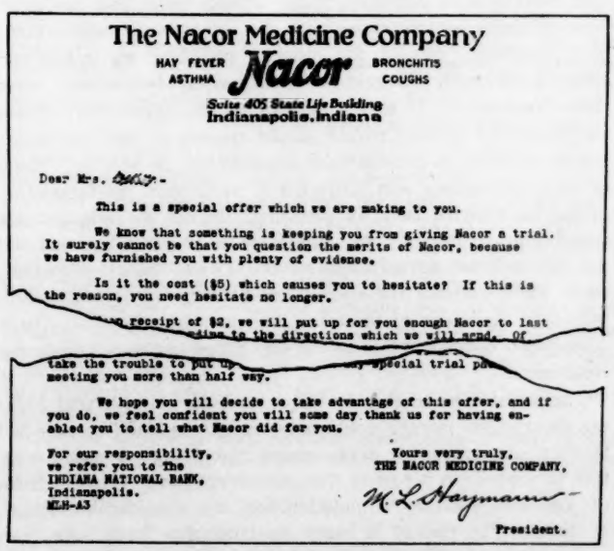
"The bottle contained 335 cc. (approximately eleven and one-half fluid ounces) of a brown liquid, possessing a bitter taste and an aromatic odor suggestive of glycyrrhiza (licorice). A small amount of suspended material settled out when the preparation was allowed to stand.

"Qualitative tests indicated the presence of potassium, magnesium, ammonium compound, iodide, chloride and sulphate. The presence of a plant extract was also indicated. Heavy metals, arsenic, antimony, calcium, sodium, emodin-bearing drugs, alkaloids and salicylates were not found. Quantitative determinations yielded the following:

Specific gravity (25 C.)	1.07
Total solids	16.4 per cent
Alcohol (by volume)	7.0 per cent
Magnesium (Mg^{++})	0.1 per cent
Potassium (K^{+})	1.6 per cent
Ammonia (NH_3)	0.6 per cent
Iodide (I^{-})	3.9 per cent
Chloride (Cl^{-})	1.4 per cent
Sulphate (SO_4^{--})	0.6 per cent

"From the foregoing, it is concluded that the product contains essentially potassium iodide 5 per cent, ammonium chloride 2 per cent, and vegetable extractive dissolved in a solution containing 7 per cent alcohol (by volume). The individual doses of ½ to 1 teaspoonful are equivalent to potassium iodide, 0.10 Gm. (1.65 gr.) to 0.21 Gm. (3.3 gr.) and ammonium chloride, 0.04 Gm. (0.7 gr.) to 0.09 Gm. (1.3 gr.). The daily doses (the remedy is to be taken three times daily) are equivalent to potassium iodide, 0.32 Gm. (5 gr.) to 0.64 Gm. (10 gr.) and ammonium chloride, 0.13 Gm. (2 gr.) to 0.2 Gm. (4 gr.).

"The Tablets:—The small envelope in which the tablets came bore the following statement: 'It is absolutely necessary that the bowels move free and easy at least once every twenty-four hours. Take one of these tablets immediately after each meal. If this causes the bowels to move too freely, take one tablet only upon retiring at night. In case bowels are naturally inclined to be loose, the tablets need not be taken. If badly constipated and tablets after meals do not prove effective, they



The Nacor Medicine Company

HAY FEVER ASTHMA **Nacor** BRONCHITIS COUGHS

Suite 405 State Life Building
Indianapolis, Indiana

Dear Mrs. [illegible]-

This is a special offer which we are making to you.

We know that something is keeping you from giving Nacor a trial. It surely cannot be that you question the merits of Nacor, because we have furnished you with plenty of evidence.

Is it the cost ($5) which causes you to hesitate? If this is the reason, you need hesitate no longer.

[illegible] receipt of $2, we will put up for you enough Nacor to last [illegible] to the directions which we will send. Of

take the trouble to put up [illegible] special trial package, meeting you more than half way.

We hope you will decide to take advantage of this offer, and if you do, we feel confident you will some day thank us for having enabled you to tell what Nacor did for you.

For our responsibility, we refer you to The INDIANA NATIONAL BANK, Indianapolis.
MLH-AS

Yours very truly,
THE NACOR MEDICINE COMPANY,
M. L. Haymann
President.

Photographic reproduction (reduced) of a typical piece of "follow-up" advertising now being sent out by M. L. Haymann in his efforts to sell "Nacor" another mixture of potassium iodide, alcohol and water for "chronic coughs" and other conditions.

should be taken only after evening meal—two, three, or four, as your case may require.' The envelope contained 50 small tablets, which qualitative tests indicated were aloin."

It is obvious from the Laboratory report that M. L. Haymann's new remedy for "chronic coughs," bronchitis, asthma, etc., is another of the potassium iodide, alcohol and water mixtures. It is equally obvious to physicians, but unfortunately not to the public, that sufferers from consumption who take a mixture of this kind may seriously jeopardize their chances of recovery.

Correspondence

THE ORATONE

To the Editor:—Some time ago Dr. Austin A. Hayden, president of the Chicago League for the Hard of Hearing, asked me to look into a device called the "Oratone" and give the League an evaluation of this device as a means of treating advanced cases of deafness. The Oratone is similar to a device which was being promoted as early as 1925 called the "Electrophone." At that time, together with some other members of the Chicago Laryngological and Otological Society, I endeavored to evaluate the claims that were being put forward by its promoters. My conclusions on the Electrophone were expressed in the following statement to a member of the Chicago League for the Hard of Hearing who wrote asking for information:

"The device, the Electrophone, which this firm is handling, appears to do nothing more for the hearing than is done in a similar way by wearing an electrical hearing device which also magnifies all sounds. If it were possible to rejuvenate the auditory nerve and restore as well a rigid conducting mechanism, as claimed in their bulletin, by the stimulation of loud sounds, the wearers of electrical hearing devices should be experiencing improvement in hearing, whereas, as a matter of fact, this is not the case."

Urbantschitz of Vienna in the early nineties undertook to rejuvenate the organ of hearing by stimulation with loud sounds. I was an observer of Urbantschitz's work in 1895 and 1896, and at that time I felt quite satisfied that all there was to this supposed rejuvenation of the hearing consisted of the education of the brain centers to a better interpretation of certain sound complexes.

The conclusions expressed regarding the Electrophone apply, in my judgment, as well as to the Oratone. In order to reach some conclusion relative to the value or lack of value of the Oratone, I selected ten individuals, members of the League, and undertook to demonstrate any improvement that might be brought about by treatments with the Oratone. I made a complete functional test of the hearing, including an audiogram, using a Western Electric 1-A audiometer before and after these treatments. It was suggested by the agent representing the Oratone Company that it would require at least ten treatments in order to demonstrate improvement in hearing. Each of these individuals was subjected to more than ten treatments before he reported back for retesting. In not a single instance was I able to discover any alteration in the hearing that did not fall well within the limits of the normal variation encountered when charting the audiometer findings. It is significant, moreover, that four of these ten patients when they came back complained of an increase in the subjective ear noises since the treatments.

The agent representing the Oratone later claimed that nothing short of six months' continuous treatments could be expected to show an appreciable improvement in hearing. I would hesitate to suggest to a patient that he subject himself to this form of intensive auditory stimulation for any considerable length of time. The reason is based on facts that have long been recognized regarding the harmful effects to the nerve of hearing from the overstimulation of loud sounds. Instead of improving the hearing as claimed by the Electrophone or the Oratone, loud sounds continued over a considerable period are known to produce a degeneration of the nerve of hearing. It has long been recognized that such degeneration is the basis for boilermakers' deafness and is quite analogous to the effect on sight from over stimulation by exposure to excessively bright lights.

Animal experiments have clearly demonstrated how this degeneration of the nerve of hearing results when the ear is subjected to intensive stimulation of loud sounds. It requires but a few weeks of such exposure to produce nerve degeneration. Increase in the subjective head noises produced by the Oratone treatments indicates clearly, in my opinion, the harmful effects of such treatments, which, if prolonged over a sufficient period, must eventually lead to increase in the deafness.

I might point out in this connection that ordinary street sounds, however distracting they may be to one's nerves, are not of the intensity sufficient to produce injury to the nerve of hearing. This applies also to the accentuation of sounds experienced while wearing an electrical hearing device. Such sounds are annoying but do not produce degeneration of the nerve of hearing.

GEORGE E. SHAMBAUGH, M.D., Chicago.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

HYPERTENSIVE DISEASE

To the Editor:—A woman, aged 36, married, 5 feet 2½ inches (157.6 cm.) tall, weight 97 pounds (44 Kg.), who has never weighed over 105 pounds (47.6 Kg.), having one daughter 15 years old consulted me a few weeks ago regarding her blood pressure, which I found to be 210 systolic and 110 diastolic. She has never been sick and is enjoying good health at this time. About one year ago, when being examined for life insurance, her blood pressure was found to be 197 systolic and 110 diastolic and she was advised to undergo medical treatment, at the beginning of which a thorough physical examination was made. Urinalysis was negative, the blood count was normal with the exception of a slight decrease in the number of erythrocytes (this has since been corrected following intravenous injections of iron and arsenic), roentgenograms of the teeth showed no pathologic changes, and the generative organs and the intestinal tract were found to be normal. The only abnormal condition found was a slight chronic involvement of the left frontal sinus, which has since been treated by a specialist, who discharged her as being cured after several months of treatments. During the past year several medical men have tried different remedies and more or less strict diets without, however, succeeding in bringing the blood pressure down. Based on this history, I have diagnosed the case as essential hypertony. Should efforts be made to reduce the blood pressure, since the patient is entirely free of any subjective symptoms? If so, what remedies could be tried? Should detoxicating liver extract subcutaneously be considered, which has not been tried in this case? What is the prognosis, and what is considered the causative agent of the condition? Kindly omit name and city.

M.D., New Jersey.

ANSWER.—From the data presented, it is impossible to state with any degree of accuracy the probable etiology of this instance of hypertensive disease. As the prognosis depends to a great extent on the etiologic factors involved and as successful therapy must be based on etiology, illumination of the etiologic background is essential. The incidence of hypertensive disease in the patient's family is important. One suspects that there may have been an intoxication of pregnancy fifteen years ago which perhaps initiated the arterial disease. Unquestionably, initiative etiologic factors existed from ten to fifteen years ago, but they may no longer be operative or evident, as, once started, hypertensive disease tends to perpetuate itself.

Gradual reduction of the arterial tension is emphatically indicated despite the absence of subjective distress on the part of the patient. Rapid and radical reduction may do harm. The hypertensive state itself constitutes a considerable menace in the following ways: The excessive cardiac burden of the high diastolic pressure constantly reduces the cardiac reserve and hastens the appearance of cardiac exhaustion, arteriolar hypertonicity probably perpetuates itself largely because of the constant fatigue of the arteriolar musculature induced by the persistent hypertonia, and the renal circulation is less efficient than when the arterial tension is gradually reduced. The fact that urinalysis was negative does not prove that the renal functional efficiency is unimpaired. The renal function should be studied (Fishberg, A. M.: The Unitary Nature of Impairment of Renal Function, *Arch. Int. Med.* **38**:259 [Aug.] 1926).

Innumerable remedies have been suggested for the management of hypertensive disease. Not one has proved entirely satisfactory. Medication should be such as to create a gradual and persistent mild arterial relaxation and should be persisted in long enough to permit of rest of the fatigued arteriolar musculature. The results with detoxicating liver extract have not proved satisfactory in the long run. Potassium thiocyanate, which is an effective vasodilator with prolonged effect, is by no means innocuous and may produce severe and even fatal intoxication. Long continued medication with small doses of bromides may prove of much value. Bismuth subnitrate

produces a gradual and prolonged arterial relaxation in instances of hypertensive disease in which no active etiologic factors are operative and no extensive arteriosclerosis exists. Bismuth subnitrate in doses of 0.65 Gm. (10 grains) three times daily is worthy of trial, for in such amounts it can do no harm. It is a mild arterial sedative and the reduction of arterial tension would be slow at best. Such slow reduction is to be desired.

The prognosis is poor. A marked diastolic hypertension in so young a woman is indicative of extensive permanent irrevocable arterial injury. The extent of organic arteriolar change largely determines the amenability to therapy. The extent of arteriolar change may be estimated either by retinoscopy (condition of the retinal arteries) or by the amyl nitrite inhalation test (Stieglitz, E. J.: Arterial Hypertension, *Arch. Int. Med.* **46**:227 [Aug.] 1930). The cardiac renal functional reserves are of essential import in evaluating the prognosis.

In addition to the references already given, further information may be found in "Arterial Hypertension" by E. J. Stieglitz (New York, Paul B. Hoeber, Inc., 1930).

MARRIAGE AND SYPHILIS

To the Editor:—I have under my care a man, aged 33, who had a clinical diagnosis of syphilis in 1918. He did not receive any antisyphilitic treatments until ten years later, when he had leukoplakia of the tongue and a 3 plus blood Wassermann reaction. At this time he received one full course, consisting of ten neoarsphenamine and twelve mercury injections. A year then elapsed and he came under my care, June 2, 1929, when his blood Wassermann reaction was 3 plus. From that time until now he has received eight courses of neoarsphenamine, eight courses of bismuth compounds and eight injections of sodium thiosulphate, 1.5 Gm. each. Repeated Wassermann tests were 4 plus, 3 plus, 1 plus, doubtful and negative; and finally, after many negatives, 1 plus and 2 plus showed up at different times. This was checked and found to be certain. The man now desires to marry but is afraid because of the persistent Wassermann reaction. What advice may I give him even after giving him the previous treatments? Should he receive any more antisyphilitic treatments? He has no clinical signs of disease. Please omit name.

M.D., New York.

ANSWER.—A cure of syphilis cannot be expected in a patient who neglected treatment for ten years after infection. He has done well under treatment and the persistent slightly positive reaction need not hinder him from marrying, provided a careful examination shows no clinical or laboratory symptoms of involvement of the central nervous system. He should have some treatment, at least one course a year, of some form of arsphenamine followed by preparations of mercury or bismuth, with iodides. He should be examined clinically and serologically every six months. With these precautions he will probably never have any further evidence of the disease except the weak positive serologic tests. A frank discussion with the prospective bride is advisable.

If there is evidence of involvement of the nervous system, marriage is inadvisable not because of any material danger of infection of the wife but because of the danger of disability of the husband and financial embarrassment.

VITAMIN A AND CALCULI

To the Editor:—1. Recent articles appearing in the literature suggest a possibility that deficiency in vitamin A is responsible for urinary calculi. What is your opinion of this? 2. In your editorial of June 25 on the early stages of vitamin A deficiency you say that metaplastic changes in the tongue, the salivary glands and the respiratory and urinary tracts were found. Do you consider these sufficient to produce definite pathologic changes? 3. A recent writer called attention to certain dangers from long continued use of vitamin A. Do you know of any experimental work that justifies this opinion? 4. Please enumerate all the precautions to be observed in preventing recurring urinary stones. Please omit name.

M.D., District of Columbia.

ANSWER.—1. A review of the present status of the physiology and pathology of vitamins has been published in recent issues of THE JOURNAL. It includes articles on vitamin A by Mendel (June 4, p. 1981) and by Eusterman and Wilbur (June 4, p. 2054). A satisfactory outline of present knowledge will also be found in Sherman, H. C., and Smith, S. L.: The Vitamins, New York, Chemical Catalog Company, Inc., 1931. An experimentally established clinical feature of shortage of vitamin A, early discovered by Osborne and Mendel, is the large incidence of calculi and calcareous deposits at various regions in the renal passages and urinary bladder in rats long deprived of vitamin A. The cells of the renal tubules seem to become "calcified" in some instances. There is a high incidence of urolithiasis in rats deprived of vitamin A. These manifold disorders and distortions of structure make clearer why it often becomes difficult if not impossible to induce restoration of health by suitable changes in diet. The parts affected, e. g., the ocular tissues or the kidneys, may have become so extensively deranged that repair is interfered with or the harm becomes irreparable. Van Leersum of Holland has reported microscopic examinations showing urinary calculi and calcium deposits present in a large proportion of rats living on a regimen deficient in vitamin A. These deposits may grow to macroscopic proportions. (van Leersum, E. C.: Vitamin A Deficiency and Urolithiasis, *Brit. M. J.* **2**:873 [Nov. 12] 1927; *J. Biol. Chem.* **76**:137 [Jan.] 1928; **79**:461 [Oct.] 1928). Although one rarely finds such extremes of deprivation of vitamin A in man as are produced experimentally in the laboratory, there is no reason to doubt that dietary conditions in man which lead to even partial avitaminosis (with respect to vitamin A) may predispose to the genesis of urolithiasis and related symptoms.

2. They are doubtless the forerunners of such changes.

3. We are not familiar with such implications. As many persons in excellent health are daily consuming liberal amounts of vitamin A and its forerunner carotene, one would scarcely expect any danger from even liberal dietary use of foods rich in such products.

4. Urinary calculi vary widely in their chemical composition; for example, they may be composed principally of uric acid, urates, calcium oxalate, or phosphates. Rarely one finds cystine calculi. It is scarcely to be assumed that such heterogeneous deposits have a common origin. Many causes may contribute to the genesis of the concretions. They are usually deposited on account of an oversaturation of the urine, or on account of a change in the composition of the kidney secretion. Sometimes this is brought about by infection of the urinary tract. The many details of prophylaxis may be found in the larger systems or textbooks of medicine.

POSSIBLE CEREBRAL HEMORRHAGE WITH DIPLOPIA

To the Editor:—A man, aged 62, while helping move a piano, lost consciousness, stepped outdoors, fell, struck his head against the porch, and was unconscious for a few hours. Paralysis did not develop. Three weeks after the fall he was brought to me complaining of pain in the left eye, and mental confusion coupled with diplopia. He said that looking at objects with both eyes had the same appearance as observing a moving train while standing near. He could see clearly out of each eye when used separately. The eye grounds were normal. The pupils were contracted and equal, and reacted to light and distance. Provided the patient had cerebral hemorrhage, either spontaneous or traumatic, what is the anatomic explanation of the diplopia? Please discuss briefly the diagnosis, prognosis and treatment.

O. Y. JANES, M.D., Cooper, Texas.

ANSWER.—This patient most likely had a subarachnoid hemorrhage, probably on an arteriosclerotic basis, which occurred before he fell and struck his head. The data given are insufficient to localize the cerebral lesion. In order to localize the damage, it would be necessary to know whether there was a Babinski reflex present; whether there was nystagmus (horizontal or rotary); whether there were changes in the peripheral fields; the results of a candle test for diplopia, and whether there was a deviation of the eyes in the form of a paralysis of one or more of the extrinsic muscles. Was there a spinal puncture done and if so was the fluid under pressure? Was there blood present and what was the cellular content and the Wassermann reaction?

Diplopia occurring with cerebral hemorrhage is usually due to the involvement of the fourth or sixth nucleus or some part of the third.

TREATMENT OF ECZEMA

To the Editor:—Kindly give your opinion of the significance, prognosis and treatment in the case of a boy, aged 18 months, who is perfectly healthy and otherwise normal except for a persistent mild eczema and a definite glycosuria on a restricted carbohydrate diet. Symptoms appeared during vaccination and an accompanying influenza. There is no increase in appetite nor thirst nor other signs of diabetes except the exacerbations of the eczema when carbohydrates are increased in his diet. No blood sugar determination has been made. Please omit name.

M.D., New York.

ANSWER.—The case cited is in all probability one of simple chronic eczema and is the most common form occurring in early life. Many of these patients are sensitized to some form of protein, and the eruption is a manifestation of the allergic state. External irritants are probably contributory rather than causal. Not infrequently a family history of allergy can be obtained. The urinary observations probably have no relation to the eczema. Diabetes mellitus at this age is extremely rare, and it should be definitely determined by fermentation tests

whether the reducing substance in the urine is actually dextrose and not pentose or lactose. Should it be found that this is a true glycosuria, blood sugar determinations are then definitely indicated, and if hyperglycemia is found the case should be treated as one of infantile diabetes. Prognosis as to the cure of the eczema should be guarded. These cases are easily improved but are cured with great difficulty. In some instances, however, the disease tends to disappear by the second year. Asthmatic symptoms develop later in about 10 per cent of the cases. As to the general treatment, it is of the greatest importance to protect the skin from external irritation. Scratching or rubbing must be prevented, and plain water or soap should never be used. When susceptibility to one or more proteins can be established by skin or clinical tests, these elements should be eliminated. In prescribing the diet, it should be borne in mind that many of these cases are aggravated by overfeeding, especially with cow's milk and carbohydrates. Free elimination by kidneys and bowels is important. In mild cases the local application of 5 or 10 per cent crude coal tar, with zinc oxide and petrolatum, has proved of value. The affected parts should be cleaned with olive oil or bran water. Calcium lactate may be given, 0.6 Gm. (10 grains) twice daily in milk.

HEMOPHILIA

To the Editor:—I have a patient, aged 6 years, with hemophilia. Though the coagulation time has been reduced to two minutes, there is still hemorrhage. Could there be any abnormal condition of the blood vessels? Please give treatment in this case. Kindly omit name.

M.D., Texas.

ANSWER.—The first question to be determined is the absolute establishment of the diagnosis of hemophilia. The following are required for an absolute diagnosis:

1. There is usually a family history of bleeding in males transmitted through the unaffected female. This is not always present, as sporadic cases are not uncommon.

2. There is prolongation of the coagulation time. The best method of determining the coagulation time is that of Howell. By this method most hemophiliac patients have a coagulation time exceeding one hour. The capillary tube method has been found to be of no value in determining the status of a patient with hemophilia.

3. The blood platelets are present in normal number.

4. The resistance of the blood platelets is greatly increased.

5. Hemorrhages into the joints are almost invariable.

It would be unusual to be successful in decreasing the coagulation time to two minutes. In general, hemophiliac patients do not bleed when the coagulation time is normal.

There has been a great deal written on the condition of the blood vessel in hemophilia; many persons believe that there is an increased fragility of the capillaries. It has also been stated that the muscular coat of the capillaries is very thin. The appearance of the capillaries of these patients under the capillary microscope does not differ from those of normal patients. The capillary resistance test, or tourniquet test, is usually negative. On a number of occasions during severe bleeding phases, the tourniquet test has been found positive. It is highly conceivable that blood with a coagulation time of over six hours might pass through a normal blood vessel.

The treatment of the patient would depend on the absolute diagnosis.

FRAGILITY OF HAIR — VESICLES ON LIP

To the Editor:—1. A young woman states that her hair has been breaking off for about six months. It does not come out from the scalp but breaks off toward the end. Her hair is as thick as usual on the scalp, but when the hairs are examined several white places are found a few millimeters apart and out toward the end of the hair; when pulled slightly, the hairs break off at the white places. There is no systemic disease and no other trouble noted. I would appreciate your giving me what information you can regarding the diagnosis and treatment of this condition. 2. Another patient states that a year or so ago the upper lip became covered with minute vesicles filled with a clear fluid. They were so small that they could be seen only by looking closely. Later these were replaced by minute firm or hard yellowish colored nodules which are still present. The lip feels stiff and slightly sore but is relieved by application of a cold cream. The patient has no systemic disease and the trouble seems to be purely local. I would appreciate diagnosis and treatment of this condition. Please omit name.

M.D., North Carolina.

ANSWER.—1. In the first case there are two disorders that must be thought of: (*a*) fragilitas crinium and (b) trichorrhexis nodosa.

Fragilitas crinium is an extreme fragility of the hair, manifesting itself in splitting of the hair near its free end or near the root, or merely by breaking off on combing or brushing. Nothing is known definitely about the etiology of this condition in adults. Kaposi's explanation that this occurs only in long hairs at points distant from the source of nutrition is probably incorrect. The treatment should include attention to the general health of the patient. The hairs that show a tendency to break off near their distal ends should be clipped off and liquid petrolatum should be used to counteract the dryness of the hair.

Trichorrhexis nodosa is a comparatively rare disease of the hair characterized by a nodose condition of the hair in which breakage or fracture of the hair shaft takes place. The nodular swellings are whitish in appearance and close inspection will show that the fibrillae look as if two small brushes had been jammed together end to end. The hair shafts are so brittle that they are readily broken. The explanation of this phenomenon is problematic. Some consider it of mycotic or bacterial origin; others base it on a trophoneurosis. The disorder is persistent and obstinate. Sabouraud advises dipping the ends of the hair in weak lotions of mercuric chloride. Other anomalies of development of the hair in which fragility occurs have been described as twisted hairs, pinsel hair, moniliform and bayonet hair.

2. In the second patient it is difficult to coordinate the eruption of vesicles one year previously, which may or may not have been a herpes, with the present condition, which suggests the minute yellowish pinpoint milium-like bodies of Fordyce disease, which are enlarged sebaceous glands. A biopsy would confirm the diagnosis. No treatment is needed.

HEALTH HAZARDS DUE TO CYANIDES IN ELECTROPLATING

To the Editor:—In the course of industrial accident work I have come across numerous cases in which patients were exposed to various gas solutions in doing electroplating work. I now have a patient who has been exposed to various cyanide solutions. He had symptoms of nausea, abdominal pain, loss of weight and extreme weakness. He was kept away from work for several weeks and during this time his symptoms disappeared. I notice the following questions and answers from a trade journal known as the *Brass World:* "Q. In the manufacture of copper shells for percolators we use a cyanide solution for removing scale, etc., left from annealing and welding. Kindly let me know whether the fumes from this solution are harmful to human health; also, if these fumes have any effect on articles that are already nickel plated and handled in the same room. A. The fumes that arise from the hot cyanide pickle are poisonous and very disagreeable to work with if the operator is using the dip continuously. We suggest that you use a hot sulphuric acid pickle for removing the scale caused by annealing and welding. It will not only be cheaper but a more satisfactory job will be produced. Use one part of sulphuric acid to four parts of water, and operate at 175 to 180 Fahrenheit. A lead-lined tank is best although an earthenware crock may be used. If the latter is used, place it in a wooden tank surrounded with water and heat the water. Q. I am operating a brass solution made as follows:

Water	1 gal.
Copper cyanide	1½ ozs.
Zinc cyanide	1½ ozs.
Sodium cyanide	8 ozs.
Sal ammoniac	1½ ozs.
Caustic soda	1 oz.

This solution plated fine for a time. Later, I discovered that some of the material I had been adding did not look very good. I then noticed crystals in the bath. I stopped using the defective chemical and got some that was good. However, there has been considerable gas coming from the tank. This has caused irritation in the nose and slight bleeding at times. Was this caused by the defective cyanide? The anodes turn dark while plating but afterward turn clear again. I have been plating cast iron which has been tumbled in sand. Some of the sand stays on them. I strike them in nickel for ten to fifteen minutes, then plate in brass solution for forty minutes. Our water has a lot of lime in it. How can I get rid of the gas? A. When brass solutions are operated at high current densities, considerable gas is given off at the cathode. This gas is very irritating to the membranes of the nose and, when inhaled, is dangerous. The tank should be equipped with a good exhaust system. An excess of free cyanide and a low metal content are factors that cause an extra amount of gas to be given off, so if you will stir solution thoroughly and take a 2 oz. sample and send it to us, we will analyze it and check these factors for you." I wish you would give me your comments through your column. Please omit name and address.

M.D., California.

ANSWER.—Certain features of the questions and answers cited in the query refer to manufacturing procedures, rather than to health hazards involved in pickling and plating. The present answer will avoid consideration of all aspects of this matter other than health hazards.

In the use of cyanides in cleaning and pickling processes, much may be done to control the quantity of hydrogen cyanide gases or vapors liberated. An acid content favors the formation of hydrocyanic acid or hydrogen cyanide gases. It is

assumed that the caustic soda mentioned in one formula is in part utilized to lessen acidity. If articles to be submerged in cyanide baths have previously been submerged in sulphuric acid baths, careful rinsing in water should intervene, in order to lessen the liberation of hydrocyanic acid through the presence of sulphuric acid. High temperatures, such as 140 F. or higher, are favorable to the liberation of hydrogen cyanide gases. A further factor in determining the quantity of gas liberated above the vat is the quantity of bubbling arising from chemical action in pickling and plating. Many thousands of bubbles so formed, on breaking at the surface of the solution, thrust a spray into the air above the vats, that otherwise would not exist to the same extent. The gas that forms at the cathode in any form of electroplating is hydrogen. Hydrogen is a minor irritant and in general a minor hazard, except as the quantity produced may reach explosive ranges, or it displaces the quantity of oxygen in the air necessary for proper respiration. Both the hydrogen given off at the cathode and the oxygen given off at the anode tend to create sprays of any plating solution and thus add to the hazards of such work.

A number of chemicals are available for use in pickling and cleaning vats, and to some extent in plating tanks, that serve as "retarders." These substances tend to limit the quantity of bubble formation, and otherwise lessen the formation of harmful gases, sprays or vapors.

EFFECTS OF SODIUM CHLORIDE, MAGNESIUM AND CALCIUM IN DIET

To the Editor:—I should like you to answer the following questions and state where information in regard to this subject may be obtained: What is the disposition of sodium chloride in the body when taken in food? Is there a chemical decomposition with combination of form; is there electrolytic action, and in what way does it affect the nervous system? If excessive sodium chloride is taken into the stomach, what would be the resultant disposition? Is it possible for a normal healthy person to take harmful quantities in the food without destroying the food flavor? On the contrary, is it not beneficial for a normal person to take quantities of sodium chloride in excess of that required in food seasoning? What happens to calcium sulphate when taken in the food? Would a quantity of 1 Gm. daily during an entire lifetime be harmful? What happens to calcium chloride when taken in the food? Would a quantity of 1 Gm. daily during an entire lifetime be harmful? Is it not possible that certain impurities in the common grade of salt might be harmful in the diet, particularly if the person is suffering from certain diseases, such as arteriosclerosis? Is magnesium carbonate harmful when taken in the food in quantities of 1 gm. daily throughout a lifetime? I should greatly appreciate any information you can give along this subject.

E. O. NICHOLS, M.D., Plainview, Texas.

ANSWER.—The answers to some of these problems and the interpretation of their possible physiologic and biochemical significance will be found in detail in the latest edition of Sherman, H. C.: Chemistry of Food and Nutrition, New York, Macmillan Company, "Except for the hydrochloric acid of the gastric juice, practically all of the chlorine involved in metabolism enters, exists in, and leaves the body in the form of chlorides—much the greater part as sodium chloride. The amount of sodium chloride which is ordinarily added to food as a condiment is so large that the amounts of sodium and chlorine present in the various foods in the fresh state become of little practical consequence." The sodium chloride ingested contributes to the composition of the gastric juice; and it is involved in the function of maintaining the normal osmotic pressures of the body fluids. There seems to be some interrelation between the taking up of salt and the retention of water in the tissues. Excess of chloride taken with the food passes through the body and is quite promptly excreted by the kidneys. The rate of elimination is quickly adapted to the rate of intake within wide variations. In Sherman's opinion, moderate variations in the amount of salt taken have no immediate significant effect on metabolism. Large amounts increase the quantity of protein catabolized and may also interfere with the absorption and utilization of the food. "Current medical opinion favors diminished intake of sodium chloride after the age of forty or thereabouts, as it is alleged to contribute to the tendency to increased blood pressure."

The inquiries regarding "combination of form" and "electrolytic action" are too vague for reply. Whether a healthy person can take harmful quantities of salt in the food without destroying the food flavor depends on individual tastes and on whether it is taken with other food or as such in separate dosage. Most persons with an undepraved appetite would find continued harmful intake of large amounts of salt mixed with food unpalatable. We are not aware of any evidence for physiologic advantage in large daily intakes of sodium chloride; e. g., an ounce (30 Gm.).

Calcium sulphate is rather insoluble and would largely pass out unchanged in the feces. Small amounts are found in some hard waters. In a normal healthy adult 1 Gm. daily could probably be tolerated without serious detriment. It would act as "ballast" in promoting bowel movement. Calcium chloride is potentially acid in the organism. Even small doses are sometimes irritating in the intestine. The common "impurities" in common salt are not menacing to health. They include traces of lime salts and iodine. Our knowledge of the physiologic rôle of magnesium in metabolism remains limited. Many persons take "milk of magnesia" in quantities comparable to the carbonate dosage cited, over long periods, as a laxative without apparent detriment. There are today few data that will permit final conclusions on the ultimate effect of most inorganic salts taken in unusual quantities "throughout a lifetime." The possible importance of contaminating "trace elements" is just beginning to receive serious attention from scientific investigators (Rose, M. S.: *Yale J. Biol. & Med.* **4**:499 (March) 1932).

ALCOHOL IN MIDDLE EAR

To the Editor:—On May 28 I was called to attend a well developed, well nourished man, aged 38, employed in the oil fields. The past history and the family history were negative. At 7:45 p. m. he had a steak dinner, with all the trimmings, and between 9 and 11 o'clock was at a friend's house, where he consumed two bottles of "home brew." On returning to his room at midnight, his left ear felt slightly "stuffed," as he expressed it, and as he had had some previous trouble in this ear he dropped from five to seven drops of ethyl alcohol into it. Within five or seven minutes he became dizzy and nauseated, he vomited, and the left side of his tongue became dry and felt as if it had been cocainized. I saw him within ten minutes of the beginning of the attack, at which time he was in a state of moderate shock, the blood pressure was 90 systolic and 60 diastolic, the pulse was slow and full, he was covered with cold perspiration, he was vomiting, and any attempt to move or walk was almost impossible because of staggering, which predominated to the left. When lying on the bed, any movement to the left increased his nausea and vomiting, and his sensation of dizziness was most pronounced to the left. Examination of the ears showed perforation of the tympanic membrane at its upper posterior border. He was given a gastric lavage, one-fourth grain (0.016 Gm.) of morphine, external heat and watched for about two hours, when the condition began to clear. Outside of weakness his general condition was good and has continued good with the exception of the presence, although less every day, of the sensation of the left side of the tongue. Am I correct in feeling that the diagnosis in this case was acute intoxication of the semicircular canals and local anesthesia of the glossopharyngeal nerve, all this directly due to a perforated drum and entrance of alcohol into the inner ear?

MAX M. VAN SANDT, M.D., Wewoka, Okla.

ANSWER.—The symptoms described are no doubt the result of marked stimulation of the vestibular apparatus due to the entrance of the alcohol into the middle ear by way of the perforation of the drum membrane. The chorda tympani nerve passes through the middle ear and it was quite likely that this was affected by the alcohol. This nerve supplies taste innervation to the anterior two thirds of the tongue. The glossopharyngeal nerve supplies ordinary sensation to the mucous membrane of the pharynx and faucial tonsils and is the nerve of taste for the posterior third of the tongue and the soft palate, and it possibly also supplies the taste buds on the upper part of the arytenoid passages. Ordinary sensation to the tongue is supplied by the lingual branches of the trigeminus or fifth cranial nerve. It is possible since the glossopharyngeal nerve is also supposed to send some sensory fibers to the middle ear that the ninth nerve could easily become involved when alcohol was dropped into the middle ear.

RECURRENT ERYSIPELAS

To the Editor:—A robust man, aged 44, incidentally an ardent golfer, is afflicted for the third successive summer with erysipelas of the right leg. The visible evidences of the lesion begin each time at the internal malleolus and spread rapidly along the internal aspect of the leg to slightly above the knee. This year the onset of the attack was five or six weeks earlier than the last two regularly recurring attacks. Was this attack precipitated by a course of erysipelas streptococcus immunogen, 9 cc. of which was given by hypodermic injection into alternate deltoid areas subcutaneously, and given about every other day over a period of seventeen days, the last being given, please note, only nine days ago? Can anything be done to prevent these attacks, which are a serious economic problem? Last year erysipelas antitoxin given during the attacks was of questionable value. Please omit name.

M.D., Massachusetts.

ANSWER.—A careful search should be made for epidermophytosis of the afflicted right foot. "Athlete's foot" is known to serve as a portal of entry for the hemolytic streptococcus causing erysipelas. If such a focus is found, a rapid cure is accomplished by repeated applications of either tincture of metaphen or tincture of merthiolate to the affected part. The erysipelas streptococcus antitoxin may have accelerated the

last attack of recurrent erysipelas by having rendered the body hypersensitive to the streptococcic antigen by the closely repeated injections of the vaccine. It is well to allow an interval of from seven to ten days between successive doses of the vaccine. Five or six subcutaneously injected dosages, administered at weekly intervals, in amounts of 0.3, 0.5, 1, 1, 2 and 2 cc., combined with the removal of existing epidermophytosis of the afflicted foot, are the best available prophylactic means against recurring attacks. The erysipelas antitoxin should not be employed prophylactically, since its protective value is rapidly dissipated within a few weeks after its injection.

ECZEMA OR RINGWORM

To the Editor:—A white woman, aged 24, has a denuded area on the medial side of each foot, which started after wearing a new pair of shoes that were tight and caused an abrasion of the skin over the dorsal surface of the foot. The abrasion began to heal and about the same time the surrounding skin became inflamed and spread toward the medial side of the foot. This began about two months ago. The lesions now are slightly larger than a dollar (about 40 mm.) and are remaining stationary. The chief symptom is itching, occurring chiefly at night; the feet are also cracked, fissured, moist, scaly and infiltrated. In warm weather the scales macerate and are painful. At times the lesions appear to be healed and then recur independent of treatment. There is no maceration of the skin between the toes. The patient has had no previous skin disorder, nor is there any in the family. Physical examination does not reveal any organic disease. The Wassermann reaction is negative. Two weeks ago one foot became swollen to twice the normal size; a physician injected some medicine in the foot which caused the swelling to disappear almost immediately. What might this have been that was injected? She also says she was treated with tar and sulphur preparations with no relief and every one has made the diagnosis of eczema. Do you think this could have originated from the abrasion due to the shoes or independent of such cause? Would roentgen treatments be of any help? Please suggest possible diagnosis and treatment. Kindly omit name and address.

M.D., South Dakota.

ANSWER.—The commonest of the possibilities in this case are eczema or some other form of simple dermatitis, and eczematoid ringworm. An examination of the scales for fungi should be made after maceration in 10 per cent solution of potassium or sodium hydroxide for from a half hour to seventy-two hours, the preparation being kept in a moist chamber. If ringworm fungi are found, the areas should be painted once a day with 1 per cent solution of potassium permanaganate, allowed to dry, and then powdered generously with talcum. If fissures appear under this treatment, it may be alternated with a mild Whitfield ointment or a salicylic acid sulphur ointment until this is corrected. The treatment should be continued long after the lesions are healed.

If no fungi are found, treatment for eczema may be instituted with soothing lotions or ointments as indicated, until acute symptoms have subsided; then stimulation may be applied cautiously. Measures should be taken to prevent repeated irritation of the areas. X-rays in fractional doses would probably be beneficial for temporary healing under either diagnosis. During their use, all stimulating or irritating treatment should be suspended.

The sudden swelling in one foot suggests a secondary infection. The fact that the patient ascribes the prompt relief of swelling to the injection is no proof that it was not due to other measures. Patients often think that an injection is being made when the physician takes material for examination.

"PLACENTAL TISSUE"

To the Editor:—For the purpose of settling a rather heated dispute would you be so kind as to answer the following question: Is it correct for a pathologist to apply the term "placental tissue" to the "decidual cast" which is passed in an ectopic gestation? No villi were seen either macroscopically or microscopically. Kindly omit name.

M.D., New York.

ANSWER.—No. It is not correct to speak of any tissue as "placental" when it fails to show placental villi.

PREVENTION OF CHIGGERS

To the Editor:—Referring to THE JOURNAL, July 30, page 412, in re the prevention of chiggers and the relief of their bites, I would say that I had a brother who was as sensitive to the chigger as the Texas M.D. and whose skin was severely irritated whenever bitten.

I found most effective the use of corrosive mercuric chloride, 4 grains (0.25 Gm.) in 96 per cent alcohol, 4 ounces (120 cc.). If this is applied, say in the morning or before coming in contact with the chiggers, it will prevent their biting, and if applied after infestation with them, will give prompt relief.

CURRAN POPE, M.D., Louisville, Ky.

Council on Medical Education and Hospitals

COMING EXAMINATIONS

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: *Written.* Nineteen cities in the United States and Canada, Oct. 22. *General, oral and clinical.* Los Angeles, Dec. 7. Sec., Dr. Paul Titus, 1015 Highland Bldg., Pittsburgh.

ARIZONA: Phoenix, Oct. 3. Acting Sec., Dr. Jos. M. Greer, Professional Bldg., Phoenix.

ARKANSAS: *Basic Science.* Little Rock, Nov. 7. Sec., Mr. Louis E. Gebauer, 1002 Donaghey Bldg., Little Rock. *Regular.* Little Rock, Nov. 8-9. Sec., Dr. Sam J. Allbright, Searcy. *Eclectic.* Little Rock, Nov. 8. Sec., Dr. Claude E. Laws, 803½ Garrison Ave., Forth Smith. *Homeopathic.* Little Rock, Nov. 8. Sec., Dr. Allison A. Pringle, Eureka Springs.

CALIFORNIA: *Sacramento,* Oct. 17-20. Sec., Dr. Charles B. Pinkham, 420 State Office Bldg., Sacramento.

COLORADO: Denver, Oct. 4. Sec., Dr. William Whitridge Williams, 422 State Office Bldg., Denver.

CONNECTICUT: *Basic Science.* New Haven, Oct. 8. Prerequisite to license examination. Address, State Board of Healing Arts, 1895 Yale Station, New Haven. *Regular.* Hartford, Nov. 8-9. Sec., Dr. Thomas P. Murdock, 147 West Main St., Meriden. *Homeopathic.* New Haven, Nov. 8. Sec., Dr. Edwin C. M. Hall, 82 Grand Ave., New Haven.

GEORGIA: Atlanta, Oct. 11. Joint Sec., Mr. R. C. Coleman, 111 State Capitol Bldg., Atlanta.

IDAHO: Boise, Oct. 4. Dir., Bureau of License, Mr. F. L. Cruikshank, Boise.

ILLINOIS: Chicago, Oct. 18-20. Supt. of Registration, Mr. Paul B. Johnson, Springfield.

MAINE: Portland, Nov. 8-9. Sec., Dr. Adam P. Leighton, Jr., 192 State St., Portland.

MASSACHUSETTS: Boston, Nov. 8-10. Sec., Dr. Stephen Rushmore, 144 State House, Boston.

MICHIGAN: Lansing, Oct. 11-13. Sec., Dr. Nelson McLaughlin, 1010 Maccabee Bldg., Detroit.

MINNESOTA: *Basic Science.* Minneapolis, Oct. 4-5. Sec., Dr. J. Charnley McKinley, 126 Millard Hall, University of Minnesota, Minneapolis. *Regular.* Minneapolis, Oct. 18-20. Sec., Dr. E. J. Engberg, 524 Lowry Medical Arts Bldg., St. Paul.

MONTANA: Helena, Oct. 4. Sec., Dr. S. A. Cooney, Power Block, Helena.

NEBRASKA: *Basic Science.* Lincoln, Oct. 4-5. Dir., Bureau of Examining Boards, Mrs. Clark Perkins, State House, Lincoln.

NEVADA: Carson City, Nov. 7-9. Sec., Dr. Edward E. Hamer, Carson City.

NEW JERSEY: Trenton, Oct. 18-19. Sec., Dr. James J. McGuire, 1101 Trenton Trust Bldg., Trenton.

NEW MEXICO: Santa Fe, Oct. 10-11. Sec., Dr. P. G. Cornish, Jr., 221 W. Central Ave., Albuquerque.

SOUTH CAROLINA: Columbia, Nov. 8. Sec., Dr. A. Earle Boozer, 505 Saluda Ave., Columbia.

TENNESSEE: Memphis, Sept. 29-30. Sec., Dr. Alfred B. DeLoach, Medical Arts Bldg., Memphis.

WYOMING: Cheyenne, Oct. 3. Sec., Dr. W. H. Hassed, Capitol Bldg., Cheyenne.

Mississippi June Report

Dr. Felix J. Underwood, secretary, Mississippi State Board of Health, reports the written examination held in Jackson, June 27-29, 1932. The examination covered 12 subjects and included 96 questions. An average of 75 per cent was required to pass. Twenty-seven candidates were examined, all of whom passed. Ten physicians were licensed by reciprocity with other states. The following colleges were represented:

PASSED		
College	Year Grad.	Per Cent
University of Arkansas School of Medicine	(1932)	85
Emory University School of Med.	(1932)	78.8, 80.7, 84.6, 84. 8, 86.2
University of Louisville School of Medicine	(1932)	82,* 82.9, 86.3
Tulane University of Louisiana School of Medicine	(1930) (1932)	87, 88.4, 81.7, 83.4, 83.7, 84.4, 84.7, 84.8, 85, 85.2, 85.4
Columbia University College of Phys. and Surgs.	(1932)	84.3
University of Tennessee College of Medicine	(1931) (1932)	82, 84.5, 80, 81.8
Vanderbilt University School of Medicine	(1932)	79.7
University of Virginia Department of Medicine	(1932)	83

LICENSED BY RECIPROCITY		
College	Year Grad.	Reciprocity with
Emory University School of Medicine	(1926)	Alabama
Tulane Univ. of Louisiana School of Med.	(1919), (1930, 3)	Louisiana
University of Minnesota Medical School	(1928)	Minnesota
University of Tennessee Coll. of Med.	(1924), (1930), (1931)	Tennessee
Baylor University College of Medicine	(1930)	Texas

* Diploma withheld.

Arizona July Report

Dr. B. M. Berger, secretary, Arizona State Board of Medical Examiners, reports the written examination held in Phoenix, July 6-7, 1932. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Six candidates were examined, 4 of whom passed and

2 failed. Three physicians were licensed by reciprocity with other states. The following colleges were represented:

College	PASSED	Year Grad.	Per Cent
College of Medical Evangelists		(1932)	84.1
Northwestern University Medical School		(1931)	88.5
Rush Medical College		(1927)	81.9
University of Michigan Medical School		(1930)	83.8

College	FAILED	Year Grad.	Per Cent
University of Minnesota Medical School		(1930)	80.7*
Jefferson Medical College of Philadelphia		(1929)	76.5*

College	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Rush Medical College		(1900)	California
University of Minnesota Medical School		(1925)	Minnesota
University of Oklahoma School of Medicine		(1928)	Oklahoma

* Received a grade below 60 per cent in one subject.

Book Notices

An Experimental and Clinical Study of Pain in the Pleura, Pericardium and Peritoneum. By Joseph A. Capps, M.D., Professor of Clinical Medicine, University of Chicago. With the collaboration of George H. Coleman, M.D., Assistant Professor of Medicine, Rush Medical College. A foreword by Anton J. Carlson, M.D., Ph.D., Chairman of the Department of Physiology, University of Chicago. Cloth. Price, $3. Pp. 99, with 33 illustrations. New York: Macmillan Company, 1932.

This monograph on pleural, pericardial and peritoneal pain is an example of what careful observation, an inquisitive mind and ingenuity can do in the realm of clinical research. Many students can well remember how Capps used to tickle, as it was then termed, the pleural surfaces and study the localization of pain after he had noticed that in the course of an aspiration the patient complained of pain in the shoulder over the region of the trapezius. Following the clue obtained at the time, Dr. Capps ingeniously devised a method of determining sensitivity and localizing it by inserting a silver wire with one end dull, the other sharp, into the respective cavities through an aspiration needle, into the pleural, pericardial and peritoneal cavities. He confirmed some of the information already known and placed on a definite and sound basis the facts that the inner two thirds of the diaphragm is innervated by the phrenic nerve and the outer one third by the lower six intercostals. By virtue of his work in the pericardium he has definitely shown that the pericardium in itself is insensitive to pain and that, when precordial pain is felt, the pain is either pleuropericardial or myocardial in origin.

The pain in coronary occlusion, even with pericardial involvement, is myocardial, not pericardial. His studies of peritoneal pain were aided by pneumoperitoneum and led to the conclusion that pain due to irritation of the central portion of the diaphragm is noted in the region of the upper margin of the trapezius muscle and, of the outer one third, over the distribution of the lower six intercostal nerves. A stimulus applied to the parietal, pleural or peritoneal surfaces manifests itself as a localized pain in a fairly definite area. The important diagnostic point is that in no instance was an irritation of the parietal pleura accompanied by pain in the pleura. The anterior and lateral aspects of the pleura can localize sensory impressions better than the posterior. His study of diaphragmatic pain was enriched by the opportunity to observe sixty-one cases of diaphragmatic pleurisy. This monograph is based not alone on the experimental work already mentioned but on careful study of numerous patients in whom an accurate localization of the pain was made possible by the lessons learned in this work and confirmed in many instances by necropsies. The presentation of the work is simple and lucid and, at the same time, brief, comprehensive and free from frills.

Materia Medica, Pharmacology, Therapeutics and Prescription Writing for Students and Practitioners. By Walter A. Bastedo, Ph.G., M.D., Sc.D., Assistant Clinical Professor of Medicine, Columbia University. Third edition. Cloth. Price, $6.50. Pp. 739, with 80 illustrations. Philadelphia & London: W. B. Saunders Company, 1932.

This book is written for students and practitioners and includes materia medica, pharmacology and therapeutics. Materia medica is treated quite adequately and on the whole satisfactorily, although the student must often search other sources to satisfy his curiosity. For example, the author includes cortin as a new drug used in the treatment of Addison's disease. There is little information for the student in the statement that epinephrine is produced by the medullary portion of the suprarenal gland, while cortin comes from the cortex. Such an amount of information is valuable, but it is not enough for the "student." Other new drugs included are quinidine, plasmochin, chiniofon (sodium iodoxyquinolinesulphonate), ethylene, the barbiturates, carbon dioxide, carbon tetrachloride, antiseptic dyes, mercurochrome-220 soluble, metaphen, phenylhydrazine, insulin, ovarian preparations, and colloidal aluminum in stomach treatments. The pharmacology as a whole is disappointing. Mere statements of fact, such as that curare acts on and paralyzes the motor nerve endings to striated muscle or that the main action of nicotine is a brief stimulation of the cerebrum, medulla and cord, of the sympathetic and parasympathetic ganglions and of the motor end plates in voluntary muscle, the stimulation being followed by depression, while they may be correct, leave much that the "student" should desire. This is only the beginning of pharmacology, and the future practitioner should know on what facts such statements rest. As the book is written, it serves more as a review for one already trained in pharmacologic methods than for the student. As an introduction to the general principles of therapeutics, the author shows more skill. The indications, methods of use and idiosyncrasies are clearly given. The chapter on prescription writing remains as in previous editions and contains the usual stock of advice and directions succinctly stated.

Normal Youth and Its Everyday Problems. By Douglas A. Thom, M.D., Professor of Psychiatry, Tufts Medical School. With an introduction by William A. Neilson, President of Smith College. Cloth. Price, $2.50. Pp. 368. New York & London: D. Appleton & Company, 1932.

A previous book by this author, entitled "Everyday Problems of the Everyday Child," met with wide acceptance and approval because of his ability to enlighten readers on this subject. Few subjects have been so much written about by unqualified people in recent years as this aspect of child life. Dr. Thom's writings are marked by a wholesome rationality. His experience is the result of contact with a mass of young people in homes, public and private schools, colleges and summer camps. He is able, therefore, to illustrate many of his chapters with case reports. The special sections of the book deal with adolescence, physical development, the development of sex, the intellectual abilities, and finally the total personality. Special chapters are concerned with educational maladjustments, conduct problems, environmental difficulties and education. The concluding chapter is intended particularly for parents who have failed to achieve a modern point of view. The book can be recommended to every reader and student in this field.

Introduction to Agricultural Biochemistry. By R. Adams Dutcher, Professor of Agricultural and Biological Chemistry, and Dennis E. Haley, Professor of Soil and Phytochemistry, Department of Agricultural and Biological Chemistry, the Pennsylvania State College. Cloth. Price, $4.50. Pp. 484, with 98 illustrations. New York: John Wiley & Sons, Inc.; London: Chapman & Hall, Ltd., 1932.

This book presents in an abbreviated typical textbook manner the more important material from the comprehensive field of agricultural chemistry. The brevity and mode of presentation are, of course, necessary for an elementary work intended for students of agriculture with rather limited training and interest in chemistry. The general plan of the book is indicated by the three main divisions: I, general and introductory, II, the plant, and III, the animal. The introductory and historical part as well as several other sections of the book are much more interesting and instructive because of the wise choice of illustrations. Four chapters are devoted to the usual discussion of the chemistry of living matter and of cell constituents. The carbohydrates and related bodies, mainly of plant origin, are discussed only in a descriptive manner, without any reference to laboratory tests or practical importance, whereas fats are discussed to some extent from an analytic point of view. Only three color reactions of proteins are discussed, and those briefly. Hydroxyglutaminic acid and methionine are omitted among the known amino-acids. The second part deals with various biochemical phases of plant physiology. A good treatment of the composition of seeds and a rather thorough consideration of the various factors involved in seed germination are followed by an extensive chapter on the soil. In this chapter, each important constituent of the soil is considered from the standpoint of

its origin, factors influencing its availability, its influence on soil constituents, and its relation to biologic soil processes. Farm manures, artficial manure, fertilizers and the atmosphere are also considered as sources of plant nutrients. The remaining chapters on the plant deal with the absorption and assimilation of nutrients from the soil and atmosphere. The synthesis of carbohydrates from carbon dioxide and water is given due consideration with the apparent acceptance of von Baeyer's theory and of Baly's evidence. Respiration in plants is considered in a general manner, with emphasis on catalytic reactions, some of which, such as xanthine oxidase, certainly deal primarily with animal metabolism. Part III, on the animal, deals with the composition of foods and feeding stuffs and their digestion, absorption and metabolism. Mineral metabolism and special dietary requirements in terms of vitamins and of adequate protein are treated critically and at some length. To the mature student, the mode of treatment may appear to lead to considerable repetition of statements; but to the type of student this work is intended for, it is probable that the divisions are chosen wisely. Actual repetition of material, even if it did occur, would most likely aid in correlating many of the varied phases touched on. It is no doubt a valuable introductory book for the student of agricultural chemistry.

Methodenlehre der therapeutischen Untersuchung. Von Paul Martini, Professor der Medizin der Universität Bonn. Paper. Price, 4.50 marks. Pp. 69, with 9 illustrations. Berlin: Julius Springer, 1932.

It is sad but true that few of the published "discoveries" in therapeutics survive the test of time: that but few articles purporting to be contributions to our knowledge of therapeutics are such in fact. This is largely due to the neglect of proper methods, which leads to erroneous results. Martini, in this brochure, aims to lay down principles for guidance in therapeutic research which, if generally adopted, would lead to improvement in therapeutic literature and acceleration of therapeutic progress, even if also to a marked diminution in the number of articles on therapeutics. Comparison is the foundation of all therapeutic research. This comparison must either be based on statistics, which are especially applicable to the acute infectious diseases, or, in chronic diseases, on observations of the course, which requires in each individual case a preliminary control period and, if possible, a control period following the test. Qualitative estimation of therapeutic value should be followed by attempts at quantitative estimation so as to permit comparison of the available remedies with one another. Lack of such quantitative estimation minimizes the value of most announcements of new remedies. Martini lays down interesting mathematical formulus for the formulation of quantitative therapeutic estimates, partly by the statistical method and partly by employment of the algebraic "laws of chances." He also shows how the relation of plotted curves to one another may be expressed mathematically. The application of these principles is shown by examples such as the evaluation of a cardiotonic in cardiac decompensation, of a so-called heart hormone in angina pectoris, of an alleged remedy for arterial hypertension. Nephritis, hyperthyroidism, chronic rheumatism and neuralgias, and peptic ulcer are, in turn, briefly discussed as to available methods for the evaluation of the results of treatment.

Diseases of the Coronary Arteries (Myocarditis). By Don C. Sutton, M.S., M.D., Associate Professor of Medicine, Northwestern University, and Harold Lueth, Ph.D., M.D. Cloth. Price, $5. Pp. 164, with 45 illustrations. St. Louis: C. V. Mosby Company, 1932.

This book has been written with the primary object of helping the physician at the bedside. Because of his rich experience in hospital and private practice, Dr. Sutton is well qualified to present, as he has done, excellent clinical pictures especially of angina pectoris and coronary thrombosis. This feature, together with illustrations, case histories and a full discussion of treatment, will make a strong appeal to the general practitioner. There will be an appeal also to other groups. Those interested in the history of cardiology and in theories as to the pathogenesis of disease, e. g., arteriosclerosis as it affects the heart, will find many historical references and not a few discussions of conflicting views. The original investigator will read with interest, if he has not already done so, condensed statements—many of them in the chapter written by Dr. Lueth on physiology and pharmacology—concerning laboratory experimental work and especially the valuable researches of the authors on cardiac pain. But they have somewhat weakened the good results of their clinical, library and laboratory studies by the fact that they have written to an audience made up of three groups, general practitioners, laboratory and research workers, and students of medical history. To write for readers of such diversified aims robs the work of much of the force that would come from concentration on one subject. The reader in one group may be confused by matter that to him is unfamiliar and irrelevant. Practitioners as a class may fail to benefit from a review of older theories or from discussion of the details of investigation, such as a laboratory set up or matters of instrumental technic. In fact, they may be confused and may not be quite sure what the author is driving at because he does not stick to the straight-ahead path. This seems to be a fault in this otherwise good book. Also to be noted are occasional violations of the rules of writing not alone good, but even correct, English.

Undersøkelser over stafylokokker: Med særlig henblikk på furunkulosens epidemiologi. Av Niels Danbolt. Skrifter utgitt av Det Norske Videnskaps-Akademi i Oslo. I. Mat.-Naturv. Klasse, 1931, No. 10. Paper. Pp. 145, with illustrations. Oslo: Jacob Dybwad, 1932.

This monograph gives the details of the bacteriologic and serologic study, conducted in the bacteriologic laboratory of the Norwegian army, of a large number of staphylococci from different sources with particular reference to furunculosis. Three main serologic types of staphylococci were found, one of which includes the strains isolated from furunculosis, osteomyelitis and purulent inflammations of the skin as well as mucous membranes, especially of the nose. In thirty-five cases of furunculosis the nose contained staphylococci of the same kind as those found in the furuncles, and the view is advanced that the nose may be an important source of the staphylococci causing furunculosis and that there may be nasal staphylococcus carriers. The treatment of furunculosis with staphylococcic vaccines gave apparently good immediate results but did not prevent relapses. Neither vaccine nor bacteriophage had any appreciable effect on the staphylococci in the nose. Other phases of pathogenic staphylococci are discussed also. The book is an important contribution in its field.

Liquorstudien bei progressiver Paralyse mit besonderer Berücksichtigung der Veränderungen während der Impfmalaria. Inaugural-Dissertation zur Erlangung der medizinischen Doktorwürde mit Genehmigung der weiterfahrenen medizinischen Fakultät der Universität Upsala vorgelegt. Von Bernhard Jacobowsky, Med. Lic. Die Verteidigung findet am 29. Mai 1929 um 10 Uhr vormittags im Hörsaal des Physiologischen Instituts statt. Paper. Pp. 206, with illustrations. Uppsala: Almqvist & Wiksell, 1929.

The author of this monograph studied the cerebrospinal fluid of dementia paralytica, with especial reference to possible changes in the fluid after treatment with malaria. The study included determinations of the refractometric index, electrical conductivity, chlorides, sugar, nitrogen, protein, and the Wassermann and Sachs-Georgi tests, with comparative determinations on whole blood and blood serum. He found that the refractometric index of the cerebrospinal fluid in patients treated by malaria was lower than in untreated patients. The electrical conductivity, however, did not show any difference. The chlorides in the fluid of both treated and untreated patients with dementia paralytica were the same but were lower than in normal persons. The sugar in both treated and untreated patients was no different than in normal persons. However, during the malarial injections the blood and cerebrospinal fluid sugar were increased. The nitrogen content showed no change. The total protein in untreated patients with dementia paralytica was usually higher than in normal persons. In treated patients the total protein was lower than in untreated ones. The cell count in the fluid of untreated patients with dementia paralytica was high, and it decreased on treatment. During the fever period, the cells were diminished, if the prognosis was good. In cases with poor prognosis, however, the cells were moderately increased. The author believes that a marked diminution of cells during the malarial treatment speaks for a favorable prognosis and that an increase of cells and a high refractometric index during treatment is indicative of a bad prognosis. The monograph is interesting, as it is the first attempt to study the cerebrospinal fluid after malaria treatment, and also because the author was able to find some prognostic significance in the study of the cerebrospinal fluid.

Principles of Preoperative and Postoperative Treatment. By Reginald Alex Cutting, M.D., C.M., M.A., Assistant Professor of Surgery, Louisiana State University Medical Center. Foreword by Rudolph Matas. Cloth. Price, $10. Pp. 812, with 76 illustrations. New York: Paul B. Hoeber, Inc., 1932.

This volume, which appeared recently in serial instalments in a surgical journal, is truly, as its author indicates, a book of "principles." Throughout the twenty-three chapters, emphasis is placed on the fundamentals on which preoperative and postoperative care are based. Procedures are described only when necessary to clarify the text or as a means of illustrating the principles discussed. The preliminary chapters of the book deal with general principles underlying rational preoperative and postoperative treatment. The titles of some of these are: preoperative and postoperative care of the average "good risk" patient; shock and collapse; blood transfusion; water balance and dehydration; disturbances of acid-base equilibrium; dilatation of the stomach; urinary disturbances, and postoperative pulmonary complications. In the remaining eleven chapters the preoperative and postoperative treatment of individual conditions are discussed, such as the care of the surgical diabetic patient, the care of patients with prostatic hypertrophy, gallbladder disease, toxic goiter, gastric cases and intestinal obstruction. One chapter each is devoted to the immediate treatment of superficial burns and craniocerebral injuries. The book is written clearly and, considering the extent of the subject, concisely. The principles are discussed thoroughly. Although not a textbook, it is sufficiently didactic to be authoritative. In addition to the personal laboratory and clinical experience of the author, it is based on an extensive review of the literature and thus presents the last word in the teaching and practice of the subject. The book not only is suitable but may be recommended to students and as a guide to surgeons in active practice. The publishers are to be congratulated for bringing out such a timely and useful book, as well as for the presentable form in which it appears.

Tratado de patología quirúrgica general. Por el Dr. Manuel Bastos Ansart, profesor auxiliar de la Facultad de medicina de Madrid. Cloth. Pp. 853, with 473 illustrations. Barcelona: Editorial Labor, S. A., 1932.

This is a treatise on general surgical pathology. The author has divided his subject into four parts, discussing trauma, infections, surgical dystrophies and neoplasms. All phases are included; many are given brief mention. Much space is consumed in the treatment of various conditions; this detracts considerably from the value of the book as a discussion of surgical pathology.

A Descriptive Atlas of Radiographs: An Aid to Modern Clinical Methods. By A. P. Bertwistle, M.B., Ch.B., F.R.C.S. Second edition. Cloth. Price, $13.50. Pp. 552, with 767 illustrations. St. Louis: C. V. Mosby Company, 1932.

This edition appears six years after the first. The author aims to supply the clinician, who is not especially concerned with the technical side, with a knowledge of what radiology is capable of revealing to him. There are a large number of roentgenograms with descriptions and clinical notes. Normal plates are found on the left-hand page so as to be readily compared with abnormal plates on the right. The original roentgenograms have been presented to the Museum of the Royal College of Surgeons. The contributors include some of the leading medical and surgical specialists of Great Britain. The field covered includes normal bones and epiphysis, congenital abnormalities, fractures, inflammation of bones, tumors of bone, injuries and diseases of joints, and the nasal, alimentary, urinary, respiratory, nervous, vascular, thyroid and female generative systems and muscles. The author's silhouette roentgenogram was evolved with the object of correlating the clinical observations with those of the roentgen ray. The ordinary roentgenogram of bone is largely a shadow photograph. The silhouette roentgenogram is one of flesh and bone. The method is simple. It consists of holding a negative up to the light or placing it in an illuminating box, and then scratching the margin of the skin with a mounted needle. When the negative is printed the margin thus outlined shows as a black line. The background is then filled in with india ink and the silhouette roentgenogram is complete. Thus the underlying cause of any swelling is more readily ascertained and muscular atrophy is immediately seen. By comparison with some of the French and German atlases, this book suffers. This being the second edition, may of the errors are unpardonable. Owing to poor originals or to poor reproduction, many of the roentgenograms are only fair. The reproduction of the normal dorsolumbar spine is poor. It is too bad the author did not have some one who could print the letters and names on his line drawings so that they would be more readable. If fewer line drawings, which are not important or especially instructive, were included, the cost of the book would have been less. Page 75 has sixteen words on the entire page. In paying $13.50 for this book the purchaser pays for a lot of blank space.

Effets éloignés du pneumothorax thérapeutique: Etude sémiologique de la résorption, des conséquences et des résultats éloignés du pneumothorax artificiel. Par L. de Weck, médecin-chef du Sanatorium Victoria (Montana). Préface du Docteur Burnand. Paper. Price, 16 francs. Pp. 129, with 16 illustrations. Paris: Masson & Cie, 1932.

This work, with an interesting preface by Burnand, deals with the remote effects of artificial pneumothorax. The first section discusses in considerable detail the modes of resorption of the pneumothorax and the mechanisms of reexpansion. The relationship of the exudative phenomena to pneumothorax is considered in fine detail. The factors that influence reexpansion both favorably and unfavorably are logically analyzed. In the next chapter the mechanical sequelae of reexpansion are discussed. The various types of thoracic retraction and scoliosis are discussed and the underlying etiologic factors analyzed. The displacements of the trachea, esophagus, heart and mediastinum are given considerable space and the changes in the dome of the diaphragm after reexpansion are described. In the next section the therapeutic effects of pneumothorax on the pulmonary lesion are considered. The author feels that the estimation of the therapeutic effects should be based on clinical observation of the patient after the lung has reexpanded, on roentgenologic evidence in the expanded lung, and on anatomic examination. From the point of view of clinical observation, he discusses the general condition and symptomatic evidence, as cough, expectoration, dyspnea, pain, functional cardiac, and vascular disturbances after reexpansion. He stresses the absence of gastro-intestinal digestive disturbances. He next covers in detail the clinical observations as evidenced by palpation, percussion and auscultation. An interesting chapter deals with the effect of pneumothorax directly on the pulmonary lesion. Another chapter deals with the roentgen examination and includes some excellent plate reproductions. In the final section the author evaluates the prognostic importance of certain factors, as age, sex, the side of the chest affected and the type of lesion. The number of cases studied, fifty-one, was comparatively small, but this handicap is compensated for by thoroughness of study. Those interested in collapse therapy will find valuable material regarding the various mechanisms of reexpansion and the principles underlying the curative influence of compression. As a final word, the author discusses the question as to when pneumothorax should be interrupted and gives some rules to be followed when the matter of reexpansion is up for consideration.

Recent Work on Ptosis (Prolapse) of the Female Pelvic Viscera. By E. Hesketh Roberts, F.R.C.S., M.B., B.S., Gynæcological Surgeon, St. John's Hospital, Lewisham, London. Cloth. Price, 9/6, foreign 11/6. Pp. 118, with 32 illustrations. London: Dickson & Scudamore, 1931.

This is an exceedingly interesting brochure on descensus of the female pelvic viscera. The first part of the book is taken up with an extensive anatomic study of the endopelvic fascia. The study of the anatomy was made by means of dissection, which is of primary importance and should precede all other methods of studying the pelvic supports. Only in this manner can one get a true knowledge of these structures. The method used by Roberts was different from the conventional procedure adopted by anatomists and, being from the surgical point of view, should aid the surgeon materially. In this description most of the emphasis is laid on the mesovesicomüllerian tissue as the main support of the pelvic viscera. An embryologic study is made to explain the conformation of the mesovesicomüllerian suspensory tissue. In a chapter on roentgenography an admirable study of the radiologic evidence of cystocele and prolapsus of the bladder is presented. By this method the pathologic conditions could be revealed in those patients who complained of stress, incontinence and frequency, where ordi-

narily the causative factors might be readily overlooked. The plates are excellent and bring out the author's point forcibly. There is a chapter on chronic cervicitis as a causative factor in prolapsus by weakening the mesovesicomüllerian supporting tissues. Roberts asserts that in curing the cervical condition by cauterization or amputation, the symptoms are relieved and ptosis is prevented. This is interesting, but the author does not seem to prove his point. This monograph should be in the hands of every surgeon who has to deal with prolapsus of the female pelvic viscera.

Medicolegal

Treatment by Chiropractor as "Medical Treatment"

(Corsten v. State Industrial Commission et al. (Wis.), 240 N. W. 834)

Corsten filed a claim with the Wisconsin industrial commission for compensation. In his claim, he included the fee of a registered chiropractor for treatments. The industrial commission refused to allow this item and Corsten appealed to the circuit court, Dane County, which ordered the item allowed. Thereupon the employer and the industrial commission appealed to the Supreme Court of Wisconsin.

The employer and the industrial commission contended, among other things, that when the 1931 Wisconsin legislature passed a bill which, had it not been vetoed by the governor, would have expressly put chiropractors on the same footing as Christian scientists under the workmen's compensation act, it indicated a legislative understanding or intent that chiropractors are not to be considered as physicians under the present workmen's compensation act. That contention, said the Supreme Court, is not without force, although standing alone it might not be controlling. Whether or not the charge of a registered chiropractor for treating an employee entitled to compensation under the workmen's compensation act is allowable as an item of compensation is to be determined by the provisions of that act. The act provides that the expense of treatment recoverable by an injured employee is limited to "medical, surgical and hospital treatment . . . or, at the option of the employee . . . (under certain circumstances) Christian Science treatment in lieu of medical treatment." The legislature might give such meaning under the act to the term "medical treatment" as it saw fit, said the Supreme Court. Manifestly, the act does not consider Christian science treatment as medical treatment, although it may constitute treatment of the sick and treatment of disease, within the meaning of the medical practice act. Under the compensation act, Christian science treatment is "in lieu of medical treatment." Neither, under the compensation act, is chiropractic treatment "medical treatment." The act appears to contemplate that only *physicians* may give the medical and surgical treatment for which compensation is allowable. The employee must choose his "attending physician" from a "panel of physicians named by the employer." Failure to maintain on the panel a reasonable number of "competent and impartial physicians" and to permit the employee to choose "his attendant (physician) from among them" is a neglect and refusal to furnish medical and surgical attendance and treatment. The industrial commission may on hearing permit an employee to select a "physician" not on the employer's panel. In determining the "reasonableness and size of the medical panel" of the employer, the commission must take into consideration the number "of competent physicians immediately available." All this indicates, said the court, that it is only *physicians* for whose attendance the employee may be compensated.

Under the medical practice act a chiropractor is not a *physician*, even though he does treat the sick and treat diseases and diagnose. Physicians are licensed to practice medicine, while chiropractors receive a "certificate of registration in the basic sciences and a license to practice chiropractic." No person not possessing a license to practice medicine and surgery, osteopathy, or osteopathy and surgery, may use or assume the title "doctor" or append to his name the words or letters "doctor," Dr.," "specialist," "M.D.," or "D.O." Thus these names and letters, said the court, may be applied only to those who are licensed as physicians to practice medicine and surgery, and, conversely, those to whom the names and letters may not apply are not physicians. Furthermore, the court continued, in *Isaacson* v. *Wisconsin Casualty Ass'n*, 187 Wis. 25, 203 N. W. 918, it was held that a chiropractor is not a "legally qualified physician" under the terms of an accident insurance policy, even though he does treat the sick in a restricted way. Bouvier's Law Dictionary (2 Rawle's 3d ed. 2586) defines a physician as: "A person who has received the degree of doctor of medicine." Webster's Dictionary defines a physician as "a doctor of medicine."

Since a chiropractor neither is a physician nor gives "medical" treatments within the meaning of the workmen's compensation act, the decision of the circuit court, allowing the fee of the chiropractor, was in error.

Hospital Records as Public Records.—A Texas statute requires the superintendent of a county hospital to "cause a record to be kept of the condition of each patient when admitted and from time to time thereafter." (Texas Rev. Civil Stats., 1925, Art. 4485.) The statute does not specifically provide that a record so kept shall be admitted in evidence, as does a similar statute in Massachusetts, and in some of the other states. *Delaney* v. *Framingham Gas Co.*, 202 Mass. 359, 88 N. E. 773. Yet, said the court of civil appeals of Texas, it is hardly likely that the intention of the legislature, in requiring the record to be kept, was restricted in purpose for the private use of the hospital, but was to give to such a record the full status of a public record, and thereby made such a record admissible in evidence. The bedside notes made by an intern in a county hospital in Texas are, therefore, admissible in evidence, even though the intern is not present to testify. A different rule applies to private hospitals, the record of whose patients is not required to be kept by law. The general rule as to the admission in evidence of records of a private hospital is announced by 22 C. J. 902, paragraph 1100, as follows:

> In the absence of a statute, hospital records are as a rule, although not invariably, held not admissible as evidence of the facts therein stated. Such records are sometimes made evidence by statute.

—Dallas Coffee & Tea Co. v. Williams (Texas), 45 S. W. (2d) 724.

Society Proceedings

COMING MEETINGS

American Academy of Physical Therapy, Philadelphia, October 12-14. Dr. Arthur H. Ring, 163 Hillside Avenue, Arlington, Mass., Secretary.

American Association of Railway Surgeons, Chicago, November 2-4. Dr. Louis J. Mitchell, 29 East Madison Street, Chicago, Secretary.

American College of Surgeons, St. Louis, October 17-21. Dr. Franklin H. Martin, 40 East Erie Street, Chicago, Director-General.

American Physical Therapy Association, Detroit, September 28-30. Dr. C. C. Vinton, 241-02 S. Conduit Blvd., Rosedale, N. Y., Secretary.

American Public Health Association, Washington, D. C., October 24-27. Dr. Kendall Emerson, 450 Seventh Avenue, New York, Acting Executive Secretary.

American Roentgen Ray Society, Detroit, September 27-30. Dr. Eugene P. Pendergrass, 3400 Spruce Street, Philadelphia, Secretary.

American Society of Tropical Medicine, Birmingham, Ala., November 16-18. Dr. Henry E. Meleney, Vanderbilt University School of Medicine, Nashville, Tenn., Secretary.

Associated Anesthetists of the United States and Canada, New York, October 17-21. Dr. F. H. McMechan, 318 Hotel Westlake, Rocky River, Ohio, Secretary.

Association of Military Surgeons of the United States, Hartford, Conn., October 20-22. Dr. J. R. Kean, Army Medical Museum, Washington, D. C., Secretary.

Clinical Orthopedic Society, Chicago, November 10-12. Dr. E. B. Mumford, Chamber of Commerce Building, Indianapolis, Secretary.

Delaware, Medical Society of, Lewes, September 27-28. Dr. W. O. La Motte, 604 Medical Arts Building, Wilmington, Secretary.

Indiana State Medical Association, Michigan City, September 27-29. Mr. T. A. Hendricks, 23 East Ohio Street, Indianapolis, Executive Secretary.

Inter-State Postgraduate Medical Association of North America, Indianapolis, October 24-28. Dr. W. B. Peck, 12½ East Stephenson Street, Freeport, Ill., Managing Director.

Kentucky State Medical Association, Louisville, October 3-6. Dr. A. T. McCormack, 532 West Main Street, Louisville, Secretary.

Pennsylvania, Medical Society of the State of, Pittsburgh, October 3-6. Dr. Walter F. Donaldson, 500 Penn Avenue, Pittsburgh, Secretary.

Southern Medical Association, Birmingham, Ala., November 16-18. Mr. C. P. Loranz, Empire Building, Birmingham, Secretary.

Vermont State Medical Society, Burlington, October 6-7. Dr. William G. Ricker, 31 Main Street, St. Johnsbury, Secretary.

Virginia, Medical Society of, Richmond, November 1-3. Miss Agnes V. Edwards, 1200 East Clay Street, Richmond, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers to THE JOURNAL in continental United States and Canada for a period of three days. Issues of periodicals are kept on file for a period of five years only. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending, but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

Alabama Medical Association Journal, Montgomery

2: 1-64 (July) 1932

Obstetric Analgesia. S. Meeker, Memphis, Tenn.—p. 1.
Observations in Spinal Anesthesia. J. H. York, Atlanta.—p. 6.
Postoperative Pulmonary Complications. J. F. Alison, Selma.—p. 16.
Internal Injuries Without Penetrating Wounds. L. J. Johns, Birmingham.—p. 21.

American Journal of Diseases of Children, Chicago

44: 1-264 (July) 1932

The Hospital's Responsibility in Preventive Medicine. H. C. Carpenter, Philadelphia.—p. 1.
Stillbirths: Analysis of Causes of Death in Three Hundred and Thirty-Eight Cases as Determined by Necropsy. J. B. Gillespie, Rochester, Minn.—p. 9.
*Numbers and Types of Organisms Found in Certain Products Used in Infant Feeding. Helen E. Mattoon, College Park, Md.—p. 16.
*Stovarsol in Treatment of Syphilis in Infants and in Children. H. A. Rosenbaum, Chicago.—p. 25.
Acid-Base Balance of New-Born Infants: II. Consideration of Low Alkaline Reserve of Normal New-Born Infants. Eleanor Marples and V. W. Lippard, New York.—p. 31.
Schick Test in the Newly Born. Jean V. Cooke and M. Sharma, St. Louis.—p. 40.
*Mechanism of Hemophilia in Infancy and in Childhood. I. N. Kugelmass, New York.—p. 50.
Basal Metabolism of Twenty-One Chinese Children Reared or Born and Reared in United States. C. C. Wang and Jean E. Hawks, Cincinnati.—p. 68.
Iron in Liver and in Spleen After Destruction of Blood and Transfusions. S. A. Gladstone, New York.—p. 81.
*Simplified Feeding Technic for Small, Prematurely Born Infant. L. W. Sauer, Evanston, Ill.—p. 106.
Some Aspects of Circulation in Premature Infant. S. Londe, Chicago.—p. 110.
A Restraining Garment to Be Used in Treatment of Children. H. L. Eder, Santa Barbara, Calif.—p. 136.
Psychiatric Work with Children: Some Present-Day Trends. F. H. Allen, Philadelphia.—p. 166.
An Early Undertaking in Hospital Social Service. M. C. Pease, New York.—p. 176.

Organisms Found in Certain Products Used in Infant Feeding.—Of twenty brands of powdered infant foods studied by Mattoon, average total colony counts made on standard agar ranged from 37 to 98,000 per gram after forty-eight hours' incubation at 37 C. The majority of organisms found were spore formers, ranging from 7 to 29,900 per gram, though micrococci, streptococci, non-spore forming rods and a few sarcinae, yeast and molds were found. Gelatin liquefiers varied from 0 to 34,000 and the number of chromogens from 0 to 8,900 per gram. No colon type colonies were noted. Average total counts of hemolyzing colonies were from 0 to 19,800 per gram, though individual counts as high as 160,000 were obtained. Viridans and beta hemolytic streptococci were found in five different products, and their presence was questionable in two others. In one product these organisms numbered as high as 160,000 per gram. Cultures obtained from this sample were not pathogenic for guinea-pigs.

Acetarsone in Treatment of Syphilis in Children.—In forty-one cases of congenital syphilis in which treatment was given by mouth, Rosenbaum obtained satisfactory results with acetarsone. In nine the treatment was begun during the first year and continued for a year or more; serologic reversal was obtained in all cases, and clinical results were excellent. Of six patients who were more than 1 year of age when treatment was begun and in whom it was continued for a year or more, serologic tests became negative in only three, though clinical results in all of them were excellent. The remaining cases were not reported as a group, since the patients were not under treatment for a period of a year. Clinical improvement occurred in all patients. The serologic tests were reversed or influenced in most cases. Few reactions occurred.

Hemophilia in Infancy and in Childhood.—The criteria necessary and sufficient for the diagnosis of hemophilia are formulated by Kugelmass on the basis of experimental and clinical studies. Quantitative determinations of the constituents involved in blood coagulation show that the hemophilic deficiency is in the primary stage of the blood clotting mechanism. Hemophilic blood shows a strikingly low prothrombin content compensated by a correspondingly high antithrombin content. The platelets are normal in number but are physiologically defective, having a slow rate of disintegration. Hemophilic blood is characterized by a blood clotting index that is less than one tenth of the normal. The index constitutes the ratio of the concentration of the substances tending to clot over those tending to favor bleeding. Accordingly, the normal index of clotting function is 0.5, whereas the hemophilic clotting index is less than 0.05. This very low index of blood clotting function is diagnostic of hemophilia. The index of blood clotting function shows a manifold increase after transfusion, but the improved clotting lasts for only forty-eight hours. Transfusion does not alter the clotting function of blood in hemophilic subjects with manifestations in the joints. Dietary protein, lipids, vitamins or minerals do not alter the deficient clotting function in hemophilia. Hemophilic persons show the absence of the female sex hormone in their tissues normally present in males. Ovarian therapy, theelin and other products of the female generative organs injected into the hemophilic subject produce no change in the clotting mechanism evaluated quantitatively. Serum injected or applied locally is not effective in controlling hemorrhage in hemophilia, unless it is fresh and rich in thrombin. But nonhemophilic bleeders respond readily to any serum and to dietary protein therapy.

Feeding Technic for Prematurely Born Infant.—During the past few years, Sauer has not used feeding by gavage for the small prematurely born infant. He has fed twelve such infants weighing less than 4½ pounds (2,040 Gm.) by a technic that he has evolved from Dr. Herbert Pott's method of feeding children with cleft palate after operation. It has proved so satisfactory that he has used it in place of gavage. It is continued until the infant has gained sufficient strength to take the Breck feeder or the bottle or to nurse at the breast. The technic is as follows: To the lower end of a long dropper or eye pipet is attached a piece of soft rubber tubing 8 cm. (3 inches) long and 5 mm. (⅛ inch) in diameter (wall, 1 mm.; lumen 3 mm.). The outfit is sterilized by boiling for five minutes. The attendant sits beside the crib, steadies the infant's head with the left hand, fills the pipet by suction with warm breast milk (from 40 to 60 drops), gently inserts the soft rubber tubing at the side of the infant's mouth, passes it back to the base of the tongue (about 2 inches [5 cm.] from the gum line) and gently presses on the bulb after the tip of the tube has reached the posterior wall of the throat. As a rule, the first feeding is given from four to six hours after birth and consists of a few drachms of sterile, diluted breast milk. This procedure is repeated at intervals of three or four hours. The quantity and quality are gradually increased so that in forty-eight hours most prematurely born infants are given seven or eight feedings of 1 ounce (30 cc.) of sterile, pasteurized undiluted breast milk every twenty-four hours. If there is a tendency to diarrhea, the breast milk is boiled in a single boiler for five minutes, sterile water replacing the amount lost by evaporation. If this does not correct the diarrhea, calcium caseinate (1 or 2 tablespoonfuls) is added to the milk before it is boiled. This is gradually reduced as the child's tolerance improves. Fluoroscopic examinations and roentgenograms taken at the time of feeding show that the milk flows from the pharynx into the stomach without being swallowed. An ounce of milk can thus be given to an infant weighing 3 pounds (1,360 Gm.) in less than ten minutes. No infant has become cyanotic as the result of this method of feeding, nor has food been aspirated. None of the infants so fed failed to gain after the first week; indeed, more than half never lost weight. As the infant's weight approaches 5 pounds, it will be noted that the hunger impulse, sucking act and swallowing usually develop spontaneously, and from then on, two and gradually more of the feedings may be given by the Breck

feeder or a small nipple. Dexterity and a little practice will enable any mother or nurse to feed an infant weighing 2, 3 or 4 pounds without gavage. This method possesses the advantages of tube feeding without any of the handicaps.

American Journal of Medical Sciences, Philadelphia

184: 1-148 (July) 1932

*Effect of Liver Therapy on Neurologic Manifestations of Pernicious Anemia. B. M. Baker, Jr., J. Bordley 3d, and W. T. Longcope, Baltimore.—p. 1.

Significance of Gastric Secretions in Pernicious Anemia. C. W. Barnett, San Francisco.—p. 24.

Anemia of Microcytic Type in Middle-Aged Women. D. Vanderhoof and D. Davis, Richmond, Va.—p. 29.

Auricular Flutter: Some of Its Clinical Manifestations and Its Treatment: Based on Study of Sixty-Five Cases. T. M. McMillan and S. Bellet, Philadelphia.—p. 33.

*"Resting Infection" in Varicose Veins: Its Diagnosis and Treatment. G. de Takáts, Chicago.—p. 57.

Genetic Origin of Tumors Supported by Their Simultaneous and Symmetrical Occurrence in Homologous Twins. J. McFarland and T. S. Meade, Philadelphia.—p. 66.

Food Poisoning Due to Yellow Micrococcus from Milk. F. W. Tanner and R. J. Ramsey, Urbana, Ill.—p. 80.

Intestinal Obstruction Caused by Food: Review of Literature and Case Report. A. H. Elliot, Santa Barbara, Calif.—p. 85.

Treatment of Megacolon by Parathormone: Report of Three Cases. L. Sheldon, R. A. Kern and E. G. Hakansson, Philadelphia.—p. 94.

Postvaccinal Encephalitis. A. H. Gordon and L. J. Rhea, Montreal, Canada.—p. 104.

Nature of Human Factor in Infantile Paralysis. G. Draper, New York. —p. 111.

Effect of Liver Therapy on Neurologic Manifestations of Pernicious Anemia.—Baker and his associates summarize the results of treatment by liver or liver extract in forty-four cases of pernicious anemia, in thirty-nine of which the patients showed signs and symptoms of definite involvement of the nervous system. The course of the disease under treatment is illustrated by an abbreviated report of five cases. Attention is drawn to the fact that large amounts of liver must be consumed over long periods before great improvement becomes manifest. Exclusive of gain in strength, improvement was noted in 31.25 per cent of the signs and symptoms of nervous system involvement in patients treated for less than six months, in 55.17 per cent of the signs and symptoms in patients treated for more than six months, and in 59.93 per cent of the signs and symptoms in eight patients with advanced subacute combined degeneration who were treated for more than ten months. The symptoms and signs that improved most noticeably were those referable to disturbances of cutaneous and muscular sensibility, and to flaccid pareses. The authors suggest that some of these symptoms and signs may be dependent on changes in the peripheral nerves.

"Resting Infection" in Varicose Veins.—According to de Takáts, varicose veins are frequently infected. The source of infection lies in teeth, tonsils, and pelvic infections, acute respiratory infections or varicose ulcers. Phlebitis in a varicose vein is a definite contraindication to injection treatment. In some cases the infection subsides to a point at which there are no clinical signs of inflammation. Nevertheless the trauma of injection treatment may activate the resting infection in the veins. The acute thrombophlebitis as a result of resting infection activated by the injection treatment is a typical picture. These patients should have proper support and may get up as soon as the rise in temperature subsides. They do not need prolonged immobilization, as do persons with a deep phlebitis. The author believes that they are safer if given ambulatory treatment. The recognition of resting infection would eliminate a number of untoward inflammatory reactions following injection treatment. The presence of a varicose ulcer does not seem to bring about such reactions during treatment as if a local immunity had developed. The history of a previous phlebitis should force one to look for local symptoms. Tender, thickened veins, palpable phleboliths, but particularly a rise in surface temperature should suggest resting infection. To activate such resting infection, provocative measures, such as vein puncture, diathermy and roentgen irradiation, may be employed. The obtained reaction is measured in four hours by the rise in skin temperature, preferably with a skin thermometer. When resting infection is diagnosed, injections should not be undertaken at that time. Obvious foci of infection should be eliminated. Repeated small doses of roentgen rays, and mild protein therapy, together with adequate support of the limb, may clear up the residual infection. Three months later the provocative tests may become negative, at which time the injection treatment is permissible. The infection, however, may not clear up for years, particularly if the site of infection is in the pelvis.

American Journal of Physical Therapy, Chicago

9: 89-112 (July) 1932

Transurethral Electrosurgery of the Obstructing Prostate. P. N. Papas, Boston.—p. 89.

Biologic Effects of Short-Wave d'Arsonvalization. H. Bordier, Lyons, France.—p. 92.

Turbinate Shrinkage by High Frequency. H. L. Sinskey, Baltimore. —p. 94.

Office Electrosurgery. J. E. G. Waddington, Detroit.—p. 100.

Sinusoidal Currents in Gastro-Intestinal Stasis. L. M. Otis, Celina, Ohio.—p. 103.

Archives of Neurology and Psychiatry, Chicago

28: 1-250 (July) 1932

Corticofugal and Association Fibers Arising from Cortex of Vermis of Cerebellum. Lauretta Bender, New York.—p. 1.

*Alternating Oculomotor Paralysis in Traumatic Middle Meningeal Hemorrhage. E. S. Gurdjian, Detroit.—p. 26.

*Tactual Perception in Alcoholism: Study of Influence of Alcoholic and Other Psychotic States of Tactual After-Effects. W. Bromberg, New York.—p. 37.

*Inconstancy of Formal Structure of Personality. F. Wertham, New York, and M. Bleuler, Liestal, Switzerland.—p. 52.

Studies in Sensation: III. Chemical Factor in Stimulation of End-Organ Giving Temperature Sensations. H. C. Bazett and B. McGlone, Philadelphia.—p. 71.

*Neurologic Aspects of Primary Anemia. R. S. Ahrens, Minneapolis. —p. 92.

*Atlanto-Occipital Evacuative Trepanation in Contusions of Brain. F. Ody, Geneva, Switzerland.—p. 112.

Basal Metabolic Rate in Epilepsy. L. A. Damon, New York.—p. 120.

Experiences in Treatment of Multiple Sclerosis with Quinine Hydrochloride. R. M. Brickner, New York.—p. 125.

Multiple Tumors of Nervous System. H. L. Stewart, Philadelphia. —p. 132.

Cerebral Circulation: Afferent Impulses from Blood Vessels of Pia. M. Levine and H. G. Wolff, Baltimore.—p. 140.

*Chronic Syphilitic Poliomyelitis. N. W. Winkelman, Philadelphia.— p. 149.

Absence of Occipital Lobe of Brain (Porencephaly) with Essentially Normal Vision. F. Jelsma, R. G. Spurling and E. Freeman, Louisville, Ky.—p. 160.

Malignant Neurofibroma of Scalp. A. Verbrugghen and A. W. Adson, Rochester, Minn.—p. 167.

Alternating Oculomotor Paralysis in Traumatic Middle Meningeal Hemorrhage.—Gurdjian calls attention to the fact that middle meningeal hemorrhage may cause alternating oculomotor paralysis. The dilated pupil in meningeal hemorrhage is usually the result of palsy of the third nerve, and one should also look for possible extra-ocular paralysis and ptosis. When the diagnosis of middle meningeal hemorrhage is made, an osteoplastic flap should be the operation of choice. It is always wise to drill a little hole or two in the bone to confirm the diagnosis. These openings should be made in close proximity to the ear, so that a possible clot that has not extended farther than the base of the middle fossa may not be missed.

Tactual Perception in Alcoholism.—Studies of the after-effects of tactual sensations made by Bromberg on patients with alcoholic and schizophrenic psychoses showed that the tendencies toward change in the after-effects found in normal persons were present in the patients. In persons suffering from alcoholism the after-effects change in such a manner as to indicate that there are organic changes in the perceptive field. These organic changes may be in the nature of sensory or vestibular influences. In alcoholism, changed sensory perception is basic for the existence of hallucinations. In patients with schizophrenia, there are no changes in the perceptive field; hallucinations among these patients are related to the special thought processes of schizophrenia. It is still an open question in what way these special thought processes influence secondarily the perceptual field.

Inconstancy of Formal Structure of Personality.—Rorschach tests done by Wertham and Bleuler on the same subject under the influence of mescaline and under normal circumstances showed a remarkable difference. Of the two Rorschach tests, the one obtained under mescaline, contrary to expectation, corresponded closely to the personality as known in life. The test obtained in normal circumstances, while agreeing in some points, gave a diametrically opposed picture of all important qualities. The authors suggest that these observations

indicate that the form of a personality is not a constant but that it also may be influenced by outer circumstances, and that the usual psychologic "type" of a person does not necessarily exhaust the description of the formal structure of his personality.

Neurologic Aspects of Primary Anemia.—Ahrens points out that a high percentage of cases of primary anemia show evidence of subacute combined degeneration of the spinal cord, and, if carefully examined, all cases would probably show cord changes at some time during the course of the disease. Because of the diversity of his observations of this condition in a series of cases he does not choose to draw conclusions as to the effect of liver therapy on combined degeneration of the spinal cord. He does not believe that conclusive evidence can be presented until a larger series of cases has been examined and reexamined by one observer over a considerable period. His impression, however, at present is that liver therapy has little or no effect on the pathologic changes in the central nervous system.

Atlanto-Occipital Evacuative Trepanation in Contusions of Brain.—The advantages of atlanto-occipital trepanation in brain contusions are enumerated by Ody thus: 1. The operation renders aid not only at the site of the primary lesions but where it is most essential to give relief; that is, to the medulla, whose centers are imperiled by peribulbar clots. 2. It allows the drainage of blood extravasated in the subarachnoid spaces even when the primary lesions cannot be exactly localized. 3. This method of drainage is more effective than the classic temporal procedure: It is made at the most dependent point and from a large lake, whereas the latter is from a region where no physiologic accumulation of fluid exists and where the blood can exude only by infiltration. 4. In atlanto-occipital trepanation, postoperative hernia of the brain does not occur as in temporal drainage. If a foraminal herniation of the cerebellum should result from increased intracranial pressure, resection of the posterior arch of the atlas would free the strangulated cerebellar tonsils after evacuation of the fluid. 5. The integrity of the skull is preserved. 6. The operation is simple and does not necessitate special instruments such as a trepan, a trephine or a burr. To the author's knowledge it has not been previously described as a therapeutic measure in traumatic lesions of the brain. He proposes it on the basis of excellent results in two cases in which it is permissible to conclude, in view of the observations at operation, that without such surgical procedure death would have occurred.

Chronic Syphilitic Poliomyelitis.—Winkelman reports a case of atypical progressive spinal muscular atrophy. Serologic tests strongly indicated a syphilitic infection. Treatment was of little value because of the advanced clinical picture. Pathologic study showed a chronic inflammatory and degenerative process in the upper part of the spinal cord and lower part of the brain stem, which had all the appearance of a syphilitic involvement. Atypical cases of the atrophies suggest a syphilitic etiology, while typical cases are usually nonsyphilitic. Early treatment must be instituted in the syphilitic variety in order to secure clinical improvement.

Archives of Ophthalmology, Chicago

8: 1-156 (July) 1932

Ophthalmologist and Lighting Problems of His Patients. W. B. Lancaster, Boston.—p. 1.
Circulation of Aqueous: II. Mechanism of Reabsorption of Fluid. J. S. Friedenwald and H. F. Pierce, Baltimore.—p. 9.
*Abuse of Theory of Focal Infection. O. R. Lourie, Boston.—p. 24.
Lighting Without Glare. C. E. Ferree and G. Rand, Baltimore.—p. 31.
Chemical Composition of Blood and Spinal Fluid in Primary Glaucoma. M. Cohen, J. A. Killian and Lena Halpern, New York.—p. 39.
Simple Method for Calculating Dioptric Power. J. I. Pascal, Boston.—p. 50.
Mechanism of Accommodation Studied Experimentally. M. F. Meyer, St. Louis.—p. 53.
*Grouped Pigmentation of Retina. W. A. Mann, Chicago.—p. 66.
Foreign Substances Injected into Vitreous of Rabbit. E. F. Krug and G. L. Rohdenburg, New York.—p. 72.

Abuse of Theory of Focal Infection.—Lourie believes that the beneficial results claimed by the supporters of the theory of focal infection are insignificant in comparison with the sacrifices involved due to operations. The mass removal of tonsils is the result of insufficient knowledge of the causes of rheumatic and other infections. Insufficient knowledge, as a rule, should not be taken as an indication for an operation. One must not forget that practice of medicine is not experimentation in a laboratory. The theory of elective affinity, as it stands, does not solve the problem of focal infection and can hardly be of help in the treatment for ocular diseases.

Grouped Pigmentation of Retina.—According to Mann, grouped pigmentation of the retina is characteristic in appearance and, once seen, will never be forgotten. It is characterized by a grouping together of spots of pigment in the retina, from three to thirty in a clump, of varying sizes uniformly grayish black, rather punched out in appearance and not fading into the remaining (normal) fundus. In size they vary from less than the diameter of a blood vessel up to the diameter of the papilla, the smaller spots usually lying near the disk, the larger farther out in the periphery. Only one portion or segment of the fundus may be involved; some cases are unilateral, others bilateral. The macula is always spared. Most observers agree that the pigment lies behind the level of the retinal blood vessels, although Holm was certain that many of the spots were in front of the vessels. The condition appears to be nonprogressive and is assumed to be congenital, although the youngest patient observed was an infant, aged 8 months. There is no effect on the central visual acuity or the visual fields. Other congenital anomalies, such as epicanthus, congenital cataract in the other eye and strabismus, have been observed in some of the recorded cases; most of them, however, are otherwise quite normal. No night-blindness has been observed. Consanguinity, hereditary syphilis and sex do not seem to be etiologic factors. There are no evidences of inflammatory or degenerative change, and the course and appearance differ so radically from retinitis pigmentosa and chorioretinitis as to make confusion impossible. Grouped pigmentation of the retina is probably much less rare than the attention given it in textbooks and case reports would indicate. The author adds three cases to the literature, together with mention of Gifford's two cases. He believes that the photographs of the fundi presented by him are the first published showing this condition.

Arch. of Physical Therapy, X-Ray, Radium, Chicago

13: 325-378 (June) 1932

Direct Internal Irradiation of Ultraviolet to Bladder. J. R. Caulk and F. H. Ewerhardt, St. Louis.—p. 325.
Massage. R. Pemberton, Philadelphia.—p. 328.
Relation of Light to Health and Disease. E. Mayer, Saranac Lake, N. Y.—p. 336.
Consideration of Some Problems in Electrocoagulation of Tonsils. L. L. Doane, Butler, Pa.—p. 341.
Removal of Pathologic Tissue En Masse by Insulated Cutting Instruments and Electrosurgical Snare. J. Prenn, Boston.—p. 345.

Archives of Surgery, Chicago

25: 1-256 (July) 1932

Congenital Malformations of Hands. A. B. Kanavel, Chicago.—p. 1.
*Monarticular Arthritis Stimulating Tuberculosis. A. D. Smith, New York.—p. 54.
Primary Carcinoma of Gallbladder. H. J. Shelley, New York, and L. I. Ross, Cleveland.—p. 65.
*Endothelioma of Dura (Meningioma). G. G. Davis and H. C. Voris, Chicago.—p. 84.
*Histology of Healing Fractures in Rats on Normal Diets. W. G. Downs, Chicago, and R. M. McKeown, New Haven, Conn.—p. 94.
Histology of Healing Fractures in Rats on Diets Low in Total Salt, Calcium and Phosphorus. W. G. Downs, Chicago, and R. M. McKeown, New Haven, Conn.—p. 108.
Tumors of Small Intestine. T. S. Raiford, Baltimore.—p. 122.
Fiftieth Anniversary of Removal of Gallbladder. Carl Langenbuch—"Master Surgeon of Biliary System." Béla Halpert, New Haven, Conn.—p. 178.
Osteomyelitis of Jaws. A. O. Wilensky, New York.—p. 183.
Review of Urologic Surgery. A. J. Scholl, Los Angeles; E. S. Judd, Rochester, Minn.; L. D. Keyser, Roanoke, Va.; Jean Verbrugge, Antwerp, Belgium; A. A. Kutzmann, Los Angeles; A. B. Hepler, Seattle, and R. Gutierrez, New York.—p. 238.

Monarticular Arthritis Simulating Tuberculosis.—Smith calls attention to the fact that monarticular arthritis, which may simulate tuberculosis very closely, is not uncommon. It is impossible to differentiate the lesions in this condition from those of tuberculosis by physical or roentgen examination. A repeatedly negative Mantoux test in such a case is suggestive but not conclusive. Exploratory operation often is the only means of making the diagnosis, and even then the gross appearance of the joint is not to be relied on. The histologic picture is that of a chronic inflammation.

Cultures on ordinary mediums are negative. The majority of the patients recover without further treatment.

Endothelioma of Dura (Meningioma).—Davis and Voris present a case of endothelioma (meningioma) of the dura. The tumor was of thirty-five years' duration with symptoms only during the three months previous to the patient's admission to the hospital. It had eroded the skull, with no attempt at new bone formation. Pressure on the tumor gave no symptoms or subjective sensations. Operative removal aggravated the symptoms with gradual improvement and a residual hemiplegia. Microscopically, the structure of the tumor was that of an atypical endothelioma of the dura with slight evidence of low grade malignancy.

Histology of Healing Fractures in Rats on Normal Diets.—According to Downs and McKeown, the cytologic processes involved in the healing of fractured fibulas in rats reveal the fundamental soundness of the views of Maximow and of Häggqvist as to the inherent abilities of connective tissue cells to change from one type to another under proper stimulus. Further, one may see adequate evidence of the physicochemical processes involved in bone healing—if the preparations are studied with this in mind. The healing of bone on standard diets reveals the process to be divisible into the following stages: 1. A fibrinous clot, lasting until about three days after fracture. 2. A fibrous clot of callus, beginning to replace the fibrinous clot at about the second day after fracture and lasting until about the twelfth day. 3. A cartilaginous callus, beginning at about the sixth day and lasting until about the twenty-seventh day. 4. A calcifying callus, beginning almost coincidentally with the formation of hypertrophic cartilage, reaching its greatest mass density at about the fifteenth day and following very closely the development and recession of the cartilage mass. 5. Last, the stage of ossification, beginning about the twenty-first day, that is, overlapping the stage of calcification and following through the later changes in the hollowing out of the marrow cavity, the organization of the cortex and the remodeling of the reformed bone. The authors show that a positive correlation exists between the cytologic periods from the inception of the fracture to the restitution of its normal histologic structure and strength. They establish a histologic control or base line for comparison with the changes found in the healing of fractured bones of animals on different types of unbalanced diets.

California and Western Medicine, San Francisco

37: 1-72 (July) 1932

*Femur Neck Fractures: Autogenous Bone-Graft Peg as Primary Treatment for Fresh Fractures. F. H. Albee, New York.—p. 1.
Treatment of Hydrocele: Researches in New Solutions for Injection Treatment: Results Compared with Operation. N. J. Kilbourne and C. J. Murray, Los Angeles.—p. 3.
Preoperative Preparation of Surgically Handicapped Patient. C. T. Sturgeon, Los Angeles.—p. 9.
Medical Costs: How Health Insurance and Group Medicine May Lower Medical Costs. P. K. Brown, San Francisco.—p. 11.
Regional Anesthesia: Its Modern Technic and Therapeutic Application. M. B. Greene, New York.
*Quinidine Therapy in Auricular Fibrillation. W. W. Newman and H. Spiro, San Francisco.—p. 19.
Thyrotoxicosis: End-Results in Its Roentgen Treatment. J. Marion Read, San Francisco.—p. 25.
Cinchophen Administration: Jaundice as Untoward Effect. L. Parsons and W. G. Harding, Los Angeles.—p. 30.
Typhoid Fever in San Francisco in 1932 Apparently Due to Shellfish. J. C. Geiger and J. P. Gray, San Francisco.—p. 33.
Leukoderma: Its Treatment. H. C. L. Lindsay, Pasadena.—p. 36.
Lure of Medical History. A. W. Meyer, San Francisco.—p. 41.
Tribute to a California Physician. M. H. Fische, Cincinnati.—p. 44.

Bone-Graft Peg as Treatment for Fractures.—Albee calls attention to the fact that in fractures of the neck of the femur treatment, from the beginning, should be directed to overcoming the obstacles to union. One should, if possible, provide physiologic and biologic influences, plus mechanical immobilization. The autogenous bone-graft peg is the only method of treatment that offers any chance of fulfilling all these requirements, because: 1. Physiologically it promptly establishes blood supply by acting as an ideal medium in conducting blood from the vascular cancellous great trochanter and the distal end of the neck to the region of the fracture and the anemic capital fragment. One of the striking features of a bone graft is its early and profuse vascularization. 2. Biologically it introduces active living bone of high proliferative potentiality. 3. Mechanically it insures absolute fixation with accurate contact of surfaces by means of a bone graft tibial peg of great strength, an important point of consideration.

Quinidine Therapy in Auricular Fibrillation.—According to Newman and Spiro, rhythm can be restored with quinidine in over 80 per cent of all patients with auricular fibrillation, in whom good compensation can first be established with rest and digitalis, regardless of the patient's age or the etiology or degree of the pathologic changes. However, mere restoration of sinus rhythm does not constitute really successful quinidine therapy, so the author would withhold it in patients over 65 years of age, and those with excessively large mitral hearts, regardless of their age, because of the danger of toxicity or embolism and the lack of permanence of the maintenance of regular rhythm in these classes of patients. In the remainder, the results are sufficiently good to justify its trial.

Florida Medical Association Journal, Jacksonville

19: 1-48 (July) 1932

Coronary Artery Disease as Related to Heart Disorders. W. L. Bierring, Des Moines, Iowa.—p. 11.
Hay Fever in Florida. F. C. Metzger, Sarasota.—p. 18.
Diabetes in the Home. R. H. Knowlton, St. Petersburg.—p. 23.
Golden Decade of Medicine and Grouping of Events by Decades. L. S. Oppenheimer, Tampa.—p. 27.
Transurethral Prostatotomy for Relief of Vesical Orifice Obstruction with McCarthy Loop or Resectotome. G. Timberblake, St. Petersburg.—p. 30.

Indiana State Medical Assn. Journal, Fort Wayne

25: 293-334 (July) 1932

Bone and Joint Tuberculosis. E. B. Mumford, Indianapolis.—p. 293.
Hormone Test for Pregnancy. G. W. Gustafson and H. M. Banks, Indianapolis.—p. 296.
Extensive Burn of Arm. C. F. Thomson, Indianapolis.—p. 301.
Prenatal Care. B. M. Taylor, Portland.—p. 302.
Addison's Disease Treated with Suprarenal Cortical Extract. M. M. Gitlin, Bluffton.—p. 309.

Journal of Biological Chemistry, Baltimore

97: 1-331 (July) 1932. Partial Index

Fatty Acids Essential in Nutrition. G. O. Burr, Mildred M. Burr and E. S. Miller, Minneapolis.—p. 1.
Effect of Insulin of Phosphorus Compounds of Muscle. S. E. Kerr and M. Eleanor Blish, Beirut, Syria.—p. 11.
Diurnal Variations of Cholesterol Content of Blood. M. Bruger and I. Somach, New York.—p. 23.
Influence of Ethyl Isothiocyanate, Ethyl Thiocyanate, and Allyl Isothiocyanate on Sulphur Metabolism in Rabbits. Marta Sandberg and Olive M. Holly, New York.—p. 31.
Production of Vitamin A by a Species of Corynebacterium. C. E. Skinner and M. F. Gunderson, Minneapolis.—p. 53.
Effect of Oral Administration of Amino-Acids and Intraperitoneal Injection of Various Elements and Hydrochloric Acid on Regeneration of Hemoglobin. H. L. Keil and V. E. Nelson, Ames, Iowa.—p. 115.
Avitaminosis: Specific Effect of Vitamin B on Growth as Evidenced by Use of Vitamin B Concentrates. B. Sure, Fayetteville, Ark. —p. 133.
Determination of Ammonia in Blood and Other Biologic Fluids. O. Folin, Boston.—p. 141.
*Basal Metabolic Rates of Vegetarians. G. Wakeham and L. O. Hansen, Boulder, Colo.—p. 155.
Renal Threshold of Bilirubin. I. M. Rabinowitch, Montreal.—p. 163. —p. 163.
Freezing Points of Serum and Corpuscles. D. A. Collins and F. H. Scott, Minneapolis.—p. 189.
*Iron Retention by Women During Pregnancy. Callie Mae Coons, Stillwater, Okla.—p. 215.
Reaction of Chicken to Irradiated Ergosterol and Irradiated Yeast as Contrasted with Natural Vitamin D of Fish Liver Oils. H. Steenbock, S. W. F. Kletzien and J. G. Halpin, Madison, Wis.—p. 249.
*Vitamin D and Conservation of Calcium in Adult. S. W. F. Kletzien, Vera M. Templin, H. Steenbock and B. H. Thomas, Madison, Wis. —p. 265.
*Effect of Administration of Iodine on Total Iodine, Inorganic Iodine, and Thyroxine Content of Pathologic Thyroid. A. B. Gutman, Ethel M. Benedict, Blanch Baxter and W. W. Palmer, New York.—p. 303.
Isolation and Identification of Vitamin C. W. A. Waugh and C. G. King, Pittsburgh.—p. 325.

Basal Metabolic Rates of Vegetarians.—Wakeham and Hansen found the average basal metabolic rate of twenty lifetime vegetarians to be 11 per cent below the Du Bois normals. Study of a large group of long time vegetarians indicated that a period of from six to eight years of vegetarianism is usually required to produce this effect. Occasional lapses from strict vegetarianism on the part of habitual vegetarians do not affect the average rate.

Iron Retention by Women During Pregnancy.—Coons reports twenty-three iron balances on women at different stages of pregnancy. With intakes varying from 9.69 to 19.45 mg. of iron a day, the retentions varied from + 0.88 to + 6.97 with one exception, a negative balance of — 2.21. Under fairly ideal conditions of diet and well being, it seems possible for the maternal organism to assimilate during the period of pregnancy enough iron from food to supply the new-born infant with the needed reserves. The quality as well as the quantity of iron intake, the physiologic demands of pregnancy, and slight upsets in digestion seemed to be important factors in iron retention.

Vitamin D and Conservation of Calcium in Adult.—Kletzien and his associates note that adult male and female rats kept on a rachitogenic diet, which contained an excessive amount of calcium in relation to phosphorus, lost mineral elements from their skeletons. This loss was reduced but not prevented by the addition of vitamin D. Two successive pregnancies uncomplicated by lactation did not decrease the ash content of the femurs. Femur ash content was markedly reduced by lactation even when generous amounts of vitamin D were incorporated in a diet which carried liberal amounts of calcium and phosphorus and some vitamin D. The calcium content of new-born young was fairly constant, irrespective of vitamin D additions to the mother's diet.

Effect of Administration of Iodine.—Gutman and his associates describe a procedure for the partition of the known iodine compounds of the thyroid, based on the method of Leland and Foster for the determination of total iodine, and aqueous extraction of the desiccated gland for estimation of inorganic iodine. The data derived by this procedure on 117 pathologic thyroids obtained after thyroidectomy and on twenty normal glands are presented. Comparison of the results on seventy thyroids of patients with exophthalmic goiter who had received iodine, with the data in the literature on thyroids of untreated patients with exophthalmic goiter, suggests the following changes as a result of iodine administration: (1) an increase in the total iodine content of the gland, due to an increase in both the inorganic iodine and thyroglobulin iodine fractions; (2) a change in the chemical nature of the thyroglobulin as evidenced by an increase in the thyroxine iodine percentage of thyroglobulin iodine and a consequent decrease in the percentage of thyroglobulin iodine not in the form of thyroxine but chiefly or entirely as diiodotyrosine; (3) an increase in the relative and absolute thyroxine and diiodotyrosine content of the gland. Comparison with the data on normal glands suggests that these changes constitute a return from the more or less depleted state of the untreated exophthalmic gland toward that of the resting gland.

Journal of Experimental Medicine, New York

56: 1-156 (July) 1932

Studies on Gallbladder Function: VIII. Fate of Bile Pigment and Cholesterol in Hepatic Bile Subjected to Gallbladder Activity. Cecilia Riegel, C. G. Johnston and I. S. Ravdin, Philadelphia.—p. 1.
Studies on Virulence: IV. Influence on Virulence of Pneumococci of Growth on Various Mediums. L. D. Felton, Boston.—p. 13.
Id.: V. Effect of Oxygen, Nitrogen and Carbon Dioxide on Virulence of Growing Pneumococci. L. D. Felton, Boston.—p. 27.
Cellular Reactions in Meninges of Rabbits to Tuberculolipoid, Protein and Polysaccharide, Compared with Effects of Tubercle Bacilli. J. van A. Bickford, New York.—p. 39.
Bodily Changes and Development of Pulmonary Resistance in Rats Living Under Compressed Air Conditions. F. J. C. Smith, J. W. Heim, R. M. Thomson and C. K. Drinker, Boston.—p. 63.
Morphologic Changes in Lungs of Rats Living Under Compressed Air Conditions. F. J. C. Smith, G. A. Bennett, J. W. Heim, R. M. Thomson and C. K. Drinker, Boston.—p. 79.
Properties of Causative Agent of Chicken Tumor: III. Attempts at Isolation of Active Principle. J. B. Murphy, E. Sturm, A. Claude and O. M. Helmer, New York.—p. 91.
Id.: IV. Association of Inhibitor with Active Principle. J. B. Murphy and E. Sturm, New York.—p. 107.
Id.: V. Antigenic Properties of Chicken Tumor I. J. B. Murphy, E. Sturm, G. Favilli, D. C. Hoffman and A. Claude, New York.—p. 117.
Typhus Fever: IV. Further Observations on Behavior of Rickettsia Prowazeki in Tissue Cultures. H. Pinkerton and G. M. Hass, Boston.—p. 131.
Id.: V. Effect of Temperature on Multiplication of Rickettsia Prowazeki in Tissue Culture. H. Pinkerton and G. M. Hass, Boston.—p. 145.
Spotted Fever: I. Intranuclear Rickettsiae in Spotted Fever Studied in Tissue Culture. H. Pinkerton and G. M. Hass, Boston.—p. 151.

Journal of Nervous and Mental Disease, New York

76: 1-104 (July) 1932

Tactile Imagination and Tactile After-Effects. W. Bromberg and P. Schilder, New York.—p. 1.
*Hemihypertonia Postapoplectica: Hemitonia Apoplectica (von Bechterew). M. Molitch, Jamesburg, N. J.—p. 25.
*Studies of Etiologic Relationship Between Somatic and Psychotic Disturbances in Pernicious Anemia: Critical Review with Case Reports. A. W. Hackfield, Zurich, Switzerland.—p. 31.
Oral and Aboral Types: Nomenclature. W. H. Davis.—p. 49.

Hemihypertonia Postapoplectica.—Molitch emphasizes the fact that hemihypertonia postapoplectica should be clearly separated from other forms of posthemiplegic movement. It is one of tonic spasm of one side of the body associated with little weakness, without contracture and coming on after an apoplectic attack. The lesion is probably located in the striopallidal system. Another striking feature is that almost all the cases have been in young persons.

Somatic and Psychotic Disturbances in Pernicious Anemia.—In a review of the literature Hackfield found that most of the reports dealing with psychoses in pernicious anemia date back to the era prior to the advent of the Minot-Murphy liver diet, the cases terminated fatally, and there is nothing to prove that the psychoses might not have disappeared had the patients survived; the authors disagree in their conclusions. Close analysis of the case records shows that, in most of the cases in which psychoses were present, no definite etiologic relationship to the psychosis was proved; many of the patients presented a history of previous psychotic attacks or other predisposing factors. In this respect the same may be said of the reports covering patients treated with the liver diet; when improvement did result, it may be attributed to the general systemic improvement. The author believes that one must regard the psychosis as a separate entity which runs its natural course, the pernicious anemia in some instances perhaps acting as the precipitating or aggravating factor. Treatment should be instituted which is directed toward the alleviation of the psychosis, and first in line stands attention to any impairment in general health.

Kansas Medical Society Journal, Topeka

33: 229-268 (July) 1932

Treatment of Hemorrhoids. B. A. Nelson, Manhattan.—p. 229.
Offensive and Defensive Factors in Mechanism of Acute Infections of Mucous Membrane. H. J. Howard, St. Louis.—p. 236.
Report of Committee on Necrology. B. R. Riley, Benedict.—p. 244.
Faith in Medicine. T. G. Orr, Kansas City, Mo.—p. 248.

Kentucky Medical Journal, Bowling Green

30: 361-410 (July) 1932

*Ununited and Delayed Union of Fractures. W. Sneed, New York.—p. 363.
Treatment of Brain Abscess. J. E. J. King, New York.—p. 371.
Symposium: Neoplasms of Urinary Bladder: Diagnosis of Bladder Neoplasms. J. R. Stites, Louisville.—p. 375.
Id.: Treatment of Bladder Neoplasms. J. T. Bate, Louisville.—p. 377.
Id.: Neurologic Surgery of Bladder Neoplasms. J. A. Bowen, Louisville.—p. 379.
Aerophagia or Gastric Pneumatosis. A. A. Shapero, Louisville.—p. 385.
Hyperthyroidism. H. C. Osborn, Ashland.—p. 387.
Three Different Kinds of Tumors in the Same Pelvis. J. G. Sherrill, Louisville.—p. 390.
Postoperative Paralytic Ileus with Recovery. W. H. Emrich, Louisville.—p. 394.
Experimental Observations on Pericarditis with Effusion. S. E. Johnson and M. Palmer, Louisville.—p. 396.
The Physician and Public Health Work. D. L. Jones, Fulton.—p. 399.
Acute Lead Poisoning in Infant: Case Report. J. W. Bruce, Louisville.—p. 402.
Treatment of Congenital Syphilis with Bismuth Arsphenamine Sulphonate (Bismarsen). T. M. Marks, Lexington.—p. 404.
The Occasional Operator. W. B. Atkinson, Campbellsville.—p. 405.
Multiple Intussusception (Quintuple): Case. C. Baron, Covington.—p. 406.
Fractures Into and Near Ankle Joint. O. Miller, Louisville.—p. 407.

Ununited and Delayed Union of Fractures.—In ununited and delayed union of fractures, Sneed does not confine himself to any one operation. In the main, when feasible he uses sliding grafts in the tibia; inlay, onlay or intermedullary grafts on the femur; onlay grafts on the radius and ulna; onlay or medullary grafts on the humerus; tibial or iliac grafts on the spine with bone chips and spongy bone as adjuncts. Beef bone is not allowed in his service for any type of graft, for the reason that he has always maintained that autogenous grafts were

better than heterogenous and they are easy to obtain from the tibia in almost any shape desirable. It takes only a few minutes more and will give a higher percentage of cures. From a dietary and medical standpoint the main object is to obtain proper assimilation of substances that are conducive to the formation of bone, and sometimes medication is beneficial as well as the aid of ultraviolet rays and diathermy. Each individual is studied carefully and put on the regimen that seems best. Calcifying dietaries accelerate bone repair. They consist of maintenance diets reinforced by nutrients that increase the assimilability of calcium and phosphate salts as well as their rate of precipitation from the blood into the bone structure. Metabolic studies have shown that the skeletal structures are the first to be called on to supply bodily tissues and organs with calcium and phosphate salts in emergencies. But when bone, the body's first reserve in these salts, becomes itself involved it has been demonstrated that the bone-forming requirements must be fulfilled in the daily dietary in order to obtain rapid repair. Newer knowledge of nutrition has as yet inadequately revealed what constitutes a so-called optimal dietary for an individual, balanced and adequate in all nutrients necessary for optimal maintenance of body functions. Suffice it to say that each meal should be varied enough to include above and beyond what is considered a normal dietary the following calcifying nutrients: acidified milk, cod liver oil with viosterol 10 D, alkali-forming foods (fruits and vegetables) and high visceral protein.

Medical Bull. of Veterans' Adm., Washington, D. C.

9: 1-118 (July) 1932

Maggots in Treatment of Chronic Osteomyelitis, Infected Wounds, and Compound Fractures: Analysis Based on Treatment of One Hundred Cases, with Preliminary Report on Isolation and Use of Active Principle. S. K. Livingston, Hines, Ill.—p. 1.

*Elliptic Human Erythrocytes: Report of Two Cases. M. C. Terry, Palo Alto, Calif., E. W. Hollingsworth and V. Eugenio, Hines, Ill.—p. 7.

Observation of Results of Modern Treatment of Dementia Paralytica over Period Exceeding Six Years; Study of One Hundred and Seventy-Two Cases. G. W. Schelm and R. S. Hubbs, Chicago. —p. 18.

Ultraviolet Irradiation in General Paresis. H. Mella, Northport, Long Island, N. Y., and R. T. O'Neil, Palo Alto, Calif.—p. 29.

Erythrocyte Count in Disturbed Psychotic Patients. G. L. Mosby, St. Cloud, Minn.—p. 33.

Value of Serial Roentgenograms in Early Diagnosis of Active Pulmonary Tuberculosis, with Suggestions for Improving Routine Methods of Detecting Positive Sputum. M. T. Moorehead, Kansas City, Mo.—p. 35.

Tuberculous Laryngitis. C. R. Johnson, Saranac Lake, N. Y.—p. 39.

Mental Treatment of Tuberculosis. B. A. Thompson, Chicago.—p. 45.

Spondylitis Deformans from Clinical and Roentgen-Ray Standpoint. E. Bogard and C. J. Johannesson, Walla Walla, Wash.—p. 58.

Cirrhosis of Liver. O. L. Nelson, Minneapolis.—p. 62.

Expert Medical Witness. G. H. Crofton, Washington, D. C.—p. 71.

Dental Care of Psychotic Patients. D. S. Bartlett, Chicago.—p. 78.

Elliptic Human Erythrocytes.—Terry and his associates have collected fifty instances of elliptic human erythrocytes and present two of their own. An analysis of the cases establishes the condition as an hereditary anomaly not incompatible with health and without any proved relation to disease, occurring in white persons, Negroes and mulattoes, and about equally divided between males and females. Both sexes may transmit it. A generation may be skipped. All four blood groups are represented. Necropsy is reported showing that oval cells were present in the smallest vessels of the cardiac muscle, spleen and suprarenals. An occasional oval erythrocyte was found in the marrow of the femur, and the marrow there, instead of having the usual yellow color and thick consistency, was reddish purple and semifluid or lymphoid. In other respects the necropsy disclosed nothing more than was anticipated from the patient's clinical condition, which was chiefly that of severe nephritis. Certain experiments are presented and discussed. Some of them were merely such as were necessary to establish the validity of the cases reported. Others yielded the following observations: 1. When the blood of one of the patients was subjected to the action of hypotonic solution of sodium chloride, the oval cells resembled in their behavior normal erythrocytes rather than the poikilocytes of a patient with anemia. 2. Both round and oval cells were shown to exist together in the peripheral circulation, and the oval shape was shown to depend on structure and not on environment. 3. It was found possible to separate the two kinds of cells and to do certain experiments that showed that the oval cells were heavier than the round cells, and that they were more resistant than the round cells to the hemolytic action of hypotonic solution of sodium chloride.

Missouri State Medical Assn. Journal, St. Louis

29: 287-346 (July) 1932

Organized Medicine and Its Debt to Community: President's Address. J. F. Harrison, Mexico.—p. 287.

The Tonsil in Tuberculosis. V. V. Wood, St. Louis.—p. 291.

Ureteral Stone. J. R. Coryell, Kansas City.—p. 294.

Gonococcal Pyelonephritis. J. G. Jones, St. Joseph.—p. 297.

Management of Chronic Prostate. H. M. Young, St. Louis.—p. 300.

The Nervous Patient. F. P. Norbury, Jacksonville, Ill.—p. 305.

Blood Transfusions by Indirect Method: Fifty-Six Without Severe Reaction. A. van Ravenswaay, Boonville.—p. 313.

New England Journal of Medicine, Boston

207: 1-48 (July 7) 1932

Importance of Intrapleural Pressures and Their Measurements in Various Pathologic Conditions: Experimental and Clinical Study. G. K. Coonse, O. E. Aufranc and M. Cooper, Columbia, Mo.—p. 1.

Some Newer Trends in Psychiatry. K. J. Tillotson, Waverley, Mass. —p. 8.

207: 49-104 (July 14) 1932

Diabetes an Important Health Problem. C. Bolduan, New York. —p. 49.

*Nature of Extrinsic Factor of Deficiency State in Pernicious Anemia and in Related Macrocytic Anemias. M. B. Strauss and W. B. Castle, Boston.—p. 55.

New Horizons in Physiology and Medicine: Hypothalamus and Visceral Mechanisms. J. F. Fulton, New Haven, Conn.—p. 60.

Nature of Extrinsic Factor of Deficiency State in Pernicious Anemia and in Related Macrocytic Anemias.—According to Strauss and Castle, the extrinsic factor essential for the specific reaction with the intrinsic factor of normal human gastric juice in the production of hematopoiesis in pernicious anemia may now be defined as a substance closely related to vitamin B, if not vitamin B itself. It is therefore suggested as a working hypothesis that addisonian pernicious anemia and the macrocytic anemia of the tropics, of sprue and of celiac disease, are due in common to the lack of a specific hematopoietic reaction between an extrinsic factor (vitamin B) and an intrinsic factor of the normal human gastric juice. In addisonian pernicious anemia, in certain cases of sprue, and in all probability in a certain proportion of all cases of the macrocytic anemia of the tropics and of celiac disease which respond to the administration of yeast, the specific reaction is absent, mainly because of a lack of the extrinsic factor as defined. The incubation of hog stomach mucosa with yeast concentrates is suggested as a method for economically preparing hematopoietic substances for use in pernicious anemia. The production of a specific macrocytic anemia in animals by the use of diets deficient in vitamin B is suggested. A possible analogy to the relation of vitamin B to hematopoiesis through the specific gastric mechanism is suggested for vitamin B in relation to the central nervous system.

New York State Journal of Medicine, New York

32: 839-896 (July 15) 1932

Anemia in the New-Born. G. Dalldorf and H. K. Russell, Valhalla. —p. 839.

Roentgenologic Manifestations and Differential Diagnosis of Carcinoma of Colon. B. R. Kirklin and H. M. Weber, Rochester, Minn. —p. 843.

Medical, Special, or Surgical Treatment of Goiter: Record of Experience. M. B. Tinker, Ithaca.—p. 851.

Poliomyelitis: Poliomyelitis Epidemic. H. T. Peck, Brooklyn.—p. 854.

Id.: Acute Anterior Poliomyelitis: Preliminary Report. B. Kramer, Brooklyn.—p. 855.

Id.: Neurologic Comments. H. R. Merwarth, Brooklyn.—p. 857.

Id.: Orthopedic Treatment of Anterior Poliomyelitis. H. C. Fett, Brooklyn.—p. 859.

Pneumonia: Types and Typing. M. A. Goldzieher, Brooklyn.—p. 860.

Id.: Serum Therapy. T. A. McGoldrick, Brooklyn.—p. 861.

Id.: Carbogen Therapy. J. J. Wittmer, Brooklyn.—p. 862.

Id.: Supportive Treatment. H. M. Moses, Brooklyn.—p. 863.

Health Examination from Standpoint of: Proctology. M. Canick, Brooklyn.—p. 865.

Id.: Cardiologist. W. E. McCollom, Brooklyn.—p. 865.

Id.: Urology. N. P. Rathbun, Brooklyn.—p. 867.

Id.: Gastro-Enterology. A. F. R. Andressen, Brooklyn.—p. 867.

Id.: Ophthalmology. J. N. Evans, Brooklyn.—p. 868.

Id.: General Medicine. S. R. Blatteis, Brooklyn.—p. 868.

Observations on Diagnosis of Early Syphilis. A. Pfeiffer, Albany. —p. 869.

Simplification of Nasal Plastic Surgery. C. R. Straatsma, New York. —p. 871.

Northwest Medicine, Seattle

31: 313-362 (July) 1932

*Massive Pulmonary Collapse: Postoperative. T. M. Joyce and E. P. Fagan, Portland, Ore.—p. 313.
Brief Review of Special Surgical Advances in 1931-1932. H. G. Willard, Tacoma, Wash.—p. 315.
Annoying Noise of Our Offices. P. Dorman, Seattle.—p. 317.
Prevention of Cancer. J. E. Else, Portland, Ore.—p. 321.
Hematuria. C. F. Engels, Tacoma, Wash.—p. 324.
Pylephlebitis Following Appendiceal Abscess. F. J. Leibly, Seattle.—p. 325.
Chronic Atrophic Arthritis: Its Modern Conceptions. E. A. Rich, Tacoma, Wash.—p. 327.
Allergic Influences in Chronic Atrophic Arthritis. T. H. Duerfeldt, Tacoma, Wash.—p. 331.
Atrophic Arthritis: What Can Be Done in Its Treatment? W. H. Goering, Tacoma, Wash.—p. 333.
*Tonsillectomy as a Curative for Vincent's Angina. C. Firestone, Seattle.—p. 335.
Acute Empyema Thoracis: Salient Points in Diagnosis and Treatment. F. E. Fowler, Astoria, Ore.—p. 337.
Thoracoplasty in Treatment of Pulmonary Tuberculosis. R. E. McPhail, Lakeview, Wash.—p. 339.
Medical Legislation. H. J. Whitacre, Tacoma, Wash.—p. 342.
Treatment of Inflammatory Conditions of Female Pelvis. F. B. Zener, Portland, Ore.—p. 344.
Trichomonas Vaginalis Vaginitis: Its Clinical Aspects. M. S. Sichel, Portland, Ore.—p. 350.

Massive Pulmonary Collapse.—Joyce and Fagan say that the symptomatology and physical signs of pulmonary atelectasis are variable and depend on the extent of involvement. It must be differentiated from pneumonia and pulmonary embolism, as a different form of treatment is indicated in each condition. In the obstructive type the therapeutic measures suggested are the removal of the obstructing material by the bronchoscope if necessary, carbon dioxide inhalation, and frequent changes of posture to promote drainage. If atelectasis is caused by some reflex mechanism, little can be done in the way of treatment, as the exact etiology is obscure; but the authors believe that carbon dioxide inhalations should be given.

Tonsillectomy as a Curative for Vincent's Angina.—Firestone points out that the practical abandonment of the idea that the spirillum is the causative organism of Vincent's angina renders the use of arsenic and its preparations irrational in the combating of this disease. In the hands of the author, this drug has proved of no more than empirical value. The offending organism, which is generally believed to be an anaerobe, finds the tonsillar crypts an excellent habitat, and it is there that it becomes insidious. Tonsillectomy performed in the routine manner aborts this disease when it is located in the tonsils or tonsillar regions. Recovery from the tonsillectomy is uneventful.

Public Health Reports, Washington, D. C.

47: 1329-1369 (June 17) 1932

Preparation of Vaccine from Fleas Infected with Endemic Typhus. R. E. Dyer, W. G. Workman, A. Rumreich and L. F. Badger.—p. 1329.
Some Instances of Rapid Rat Infestation of Vessels. C. L. Williams.—p. 1331.

47: 1371-1418 (June 24) 1932

Acute Respiratory Disease in University of Michigan Students, 1917 to 1931: Incidence of Cases Attended by University Physicians Among Students at University Health Service. W. E. Forsythe.—p. 1371.

47: 1419-1468 (July 1) 1932

Epidemic of Mild Dysentery-Like Disease in Cattaraugus County, New York, Summer of 1930. Dorothy G. Wiehl and Mary Gover.—p. 1419.
Some Administrative Problems of Sick Call in Penal Institutions. C. A. Bennett.—p. 1426.

47: 1469-1508 (July 8) 1932

Sanitation at Yorktown Sesquicentennial Celebration. A. P. Miller.—p. 1471.

Radiology, St. Paul

19: 1-66 (July) 1932

Work of National and International Committees on Roentgen-Ray and Radium Protection. L. S. Taylor, Washington, D. C.—p. 1.
Roentgen-Ray Protection from Manufacturer's Viewpoint. W. S. Werner, Covington, Ky.—p. 5.
Protection in Roentgen-Ray Therapy. W. Stenstrom, Minneapolis.—p. 7.
Radium Protection. G. Failla, New York.—p. 12.
Protection in Diagnostic Roentgenology: Avoiding Dangers of Roentgen-Ray Exposure and High Tension Shock. W. E. Chamberlain, Philadelphia.—p. 22.
Legal and Insurance Aspects of Protection in Radiology. H. F. Wanvig, New York.—p. 29.
*Hodgkin's Disease. E. L. Jenkinson, Chicago.—p. 41.
Medical Expert Witness Receiving a Percentage of Amount of Judgment for His Fee. I. S. Trostler, Chicago.—p. 50.

Hodgkin's Disease.—Jenkinson calls attention to the fact that bone changes in Hodgkin's disease are not uncommon. His observations have led him to believe that the extension of Hodgkin's disease to the bones is similar to the extension from carcinoma. The vertebrae, ribs, bones of the pelvis, and the proximal third of the femurs are usually involved. Bones rich in red bone marrow are attacked, whereas bones poor in red marrow are relatively free of involvement. The roentgen changes are not sufficiently characteristic to make a diagnosis of the disease in the absence of clinical signs. Cartilage, from the author's experience, is resistant to Hodgkin's disease. Localized, well directed irradiation is superior to generalized treatment.

South Carolina Medical Assn. Journal, Greenville

28: 153-175 (June) 1932

Accomplishments of Preventive Medicine. E. S. Judd, Rochester, Minn.—p. 157.

Western J. Surg., Obst. & Gynecology, Portland, Ore.

40: 343-400 (July) 1932

Cerebrocranial Injuries: Review of One Hundred and Ninety Cases. G. W. Swift, Seattle.—p. 343.
Chiasmal Syndromes. A. J. McLean, Portland, Ore.—p. 355.
*Skin Temperature Studies: Cases Characterized by Vasospasm. W. K. Livingston, Portland, Ore.—p. 371.
Roentgen Therapy in Chronic Sinusitis. F. E. Butler and I. M. Woolley, Portland, Ore.—p. 379.
Postgraduate Training of Students in Surgery at University of California. H. C. Naffziger and H. G. Bell, San Francisco.—p. 384.
Treatment of Parathyroid Tetany and Allied Conditions with Vitamin D. J. C. Brougher, Vancouver, Wash.—p. 390.

Skin Temperature Studies.—Livingston reports two cases each of chronic arthritis, Raynaud's disease and thromboangiitis obliterans in which he performed sympathectomy. The results obtained were good simply because the preoperative skin temperature studies actually demonstrated a marked element of vasospasm and relatively little occlusion. The results of this operation were strikingly consistent with these prognostic tests. Removal of the third lumbar sympathetic ganglion appears to release completely the vessels of the lower limb from sympathetic control. This is consistent with the known facts regarding the origin of the preganglionic neurons supplying vasoconstrictor impulses to the lower limbs. Removal of the third thoracic sympathetic ganglion appears to release completely the vessels of the upper limb. Removal of the third thoracic ganglion alone, or the second and third, seems to be preferable to the usual operation since the patient is spared the Horner syndrome. The only reason that the more extensive operations might be preferable is that there are often variations in the anatomy of the sympathetic trunks, and a more extensive operation increases the chances of complete interruption of impulses to the limb. By making certain that all aberrant fiber bundles are divided at the level of the third ganglion, one should obtain satisfactory results. Vasospastic phenomena and occlusive lesions of the blood vessels are closely interrelated. The cases that show relatively little evidence of occlusion are uncommon. Sympathectomy for this limited group gives a uniformly satisfactory vascular release.

Yale Journal of Biology and Medicine, New Haven

4: 749-836 (July) 1932

Westel Willoughby: Litchfield County Pioneer. C. Barker, New Haven, Conn.—p. 749.
Irish School of Medicine. G. Blumer, New Haven, Conn.—p. 765.
*Ulcerative Colitis of Psychogenic Origin: Report of Six Cases. A. J. Sullivan and Caroline A. Chandler, New Haven, Conn.—p. 779.
Some Effects of Posterior Pituitary on Water Metabolism. H. G. Barbour, New Haven, Conn.—p. 797.
Studies with Staphylococcus Bacteriophage: I. Preparation of Polyvalent Staphylococcus Bacteriophage. M. L. Rakieten.—p. 807.

Ulcerative Colitis of Psychogenic Origin.—According to Sullivan and Chandler, there seems to be no doubt that psychic trauma may be the initiating factor in certain cases of organic disease. Clinicians have noted for years that a severe mental shock may be the precipitating factor in the onset of such diseases as thyrotoxicosis, diabetes mellitus and asthma. Peptic ulcer, ulcerative colitis and, perhaps, other gastro-intestinal diseases may likewise be related to severe emotional crises. The authors report six cases of chronic ulcerative colitis in which psychogenic factors seem to have been of major importance in the onset and course of the disease.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

Brain, London

55: 145-286 (June) 1932

*Certain Pathologic Aspects of Neurosyphilis. Ruby O. Stern.—p. 145.
Acute Perivascular Myelinoclasis ("Acute Disseminated Encephalomyelitis") in Smallpox. J. P. Marsden.—p. 181.
Note on Result Which Follows Grafting of Raw Peripheral End of Divided Cervical Sympathetic Nerve to Another Nerve in the Vicinity. A. B. Duel and C. Ballance.—p. 226.
Influence of Section of Vestibular Nerve on Single-Shock Reflex Flexor Response. E. G. T. Liddell, K. Matthes, E. Oldberg and T. C. Ruch. —p. 232.
Reflex Release of Flexor Muscles by Spinal Section. E. G. T. Liddell, K. Matthes, E. Oldberg and T. C. Ruch.—p. 239.
*Spastic Pseudosclerosis (Corticopallidospinal Degeneration). C. Davison. —p. 247.
Differentiation of Behavior Patterns in Fetus and Infant. O. R. Langworthy.—p. 265.
Reflex Activity of Spinal Cord. R. S. Creed, D. Denny-Brown, J. C. Eccles, E. G. T. Liddell and C. S. Sherrington.—p. 278.

Pathologic Aspects of Neurosyphilis.—Stern studied a series of cases of dementia paralytica with especial reference to pathologic changes. The constant presence of lesions in the basal ganglions in dementia paralytica identical with, and often as severe as, those in the cerebral cortex is emphasized, and the relationship of these lesions to the characteristic tremor is discussed. The conclusion is reached that except for the demonstration of spirochetes in the brain, the most reliable and the quickest method by which dementia paralytica can be diagnosed histologically is by means of the prussian blue reaction in the microglial cells. This method is applicable to material after prolonged fixation. The frequent occurrence of syphilitic lesions, which are often symptomless, in the aorta is contrasted with the rarity of other visceral lesions in dementia paralytica and tabes dorsalis. The extreme difficulty of finding spirochetes in the aorta in the aortitis that occurs in association with these two forms of syphilis of the nervous system strongly suggests that the presence of the spirochete is not essential for the development of the aortic lesion; the question of the existence of spirochetal toxins is raised. The influence of age on the morbid process in dementia paralytica is discussed. Degeneration and disappearance of nerve cells appeared to be the feature of the congenital case; no exceptional lesions could be demonstrated in the brains of elderly patients.

Spastic Pseudosclerosis.—Davison describes a disease of comparatively short duration occurring in two adults without any demonstrable etiology and presenting mental changes, pyramidal tract signs, absent abdominal reflexes and striatal symptoms. Pathologically there was atrophy of the cerebral convolutions from the frontal to the parietal regions, scantiness and destruction of the ganglion cells in the third, fifth and sixth laminae with areas of devastation, proliferation of glia and vessels, degeneration of the pyramidal tracts, calcification of the vessels of the pallidum, status demyelinatus of the pallidal fibers, and changes in the anterior horn cells of the spinal cord. The name "disseminated encephalomyelopathy" is descriptive of the clinical syndrome and its pathology, but for the present the author considers it advisable to adopt Jakob's term, "spastic pseudosclerosis."

British Medical Journal, London

1: 1157-1200 (June 25) 1932

*Total Abdominal Hysterectomy for Myoma of Uterus, with Especial Reference to Cancer of Cervix After Subtotal Operation. H. R. Spencer.—p. 1157.
Some Causes of Failure in Vaccine Therapy. E. C. Lowe.—p. 1160.
*Modern Treatment of Gastro-Enteroptosis. A. P. Cawadias.—p. 1163.
*Note on Food Allergy. A. M. Kennedy.—p. 1167.
Nomenclature and Functional Nervous Disorder. Doris M. Odlum.—p. 1169.

Abdominal Hysterectomy for Myoma of Uterus.—Thirty years ago, Spencer reported the first fourteen cases in which he had performed total abdominal hysterectomy for myoma of the uterus, his first operation being dated Dec. 19, 1899. Since that time he has always performed the total operation and not once the subtotal for cases requiring hysterectomy. He was led to substitute the total for the partial operation by studying the drawbacks of the latter (postoperative hemorrhage, exudates, discharges, ileus) and especially by recognizing its liability to be followed by malignant disease of the remaining stump, as evidenced by many observers and by his own experience (in 1896 and 1899) of sarcoma developing in two out of thirty cases of amputation for myoma (6.6 per cent). Besides those two cases he has observed four cases of cancer of the stump after amputation by other operators. One of these occurred twelve years after the amputation; it was treated by radium and the patient remains well after five years. The other five patients with malignant disease following amputation all succumbed. In the paper mentioned he gave reasons for the opinion, which he still holds, that the total operation is in all respects a better and safer operation than amputation, the so-called subtotal operation, except that it takes a few more minutes to perform.

Treatment of Gastro-Enteroptosis.—According to Cawadias, inefficacy in the treatment of gastro-enteroptosis is due to the erroneous conception of the unity of this morbid condition. Gastro-enteroptosis is not one disease. There are four distinct forms of it, and one could, in fact, from the nosographic point of view, speak of four different diseases. These are (1) the constitutional gastro-enteroptosis, or Stiller's syndrome; (2) the neurotic gastro-enteroptosis, or Adler's syndrome; (3) the organic gastro-enteroptosis, or Glenard's syndrome, and (4) the gastro-enteroptosis complicated by perivisceritis. For a perfect individualization of the therapeutic handling (the only safe way to success) one must consider this division, which is based not on a static but on a dynamic clinical observation of gastro-enteroptosis and also on the observation of the action of various therapeutic agents.

Note on Food Allergy.—Kennedy considers that in the diagnosis of a case of food allergy the history is of the greatest importance. Careful inquiry into each attack is essential, and all varieties of food taken at every meal must be reviewed and their relation to attacks or the absence of attacks noted. A previous history in the patient or his family and antecedents of asthma, hay fever, urticaria, angioneurotic edema, migraine, eczema, or even gastro-intestinal symptoms, is suggestive. Sometimes the patient himself will suspect certain foods which seem to disagree with him, or he may have definite dislikes in regard to certain articles. In those cases the effect of the elimination of such foods from the diet should be tried. It is often necessary to get the patient to keep, for a time, a diary of all the articles of food he eats and to note the occurrence or exacerbation of symptoms. It may then appear that symptoms are always present on the day when some particular kind or combination of food has been taken or on the following day. Another method is to draw up a series of trial diets, each differing from the other as far as possible and containing foods that only rarely produce allergic effects. Each diet is tried in turn for one or two weeks until one is found that does not produce symptoms. This is then used as a basic diet, and to it new foods are added every three or four days, beginning with those least likely to produce allergy. Any food that gives rise to symptoms is then permanently excluded, and eventually the patient will know exactly what food he must avoid. Skin tests similar to those with pollens in hay fever have been tried in the recognition of allergic foods, but they are by no means infallible. At present a careful history, a scrutiny of the diet, and the use of trial diets constitute the principal lines to be followed in the recognition of the offending food. Treatment resolves itself mainly into careful exclusion of the particular food responsible for the symptoms. In some cases prolonged exclusion of the food from the dietary results in desensitization, and the patient eventually can resume taking the food, beginning with small quantities. This is always worth trying. With the important foods, such as milk and eggs, an attempt may be made to desensitize the patient by feeding with slowly increasing quantities (beginning with minute traces of the diluted article) over a period of several months. Less important foods may be simply omitted without further ado. Epinephrine often relieves the urticaria, angioneurotic edema, serum rash, and asthma of allergy. Sometimes the other allergic manifestations may be relieved by full doses of epinephrine hypodermically or intramuscularly, and in some cases this may relieve the pain better than morphine.

East African Medical Journal, Nairobi

9: 58-86 (June) 1932

Educational Aspect of Public Health Work in Tropics, with Especial Reference to Kenya. J. H. Sequeira.—p. 59.
Treatment of Ulcers by Skin Grafting. T. F. Anderson and M. A. W. Roberts.—p. 79.

Irish Journal of Medical Science, Dublin

No. 78: 241-332 (June) 1932

Dublin Medical Journals. T. P. C. Kirkpatrick.—p. 243.
Sir Dominic Corrigan, Bart. H. Rolleston.—p. 261.
Diagnosis and Treatment of Hyperthyroidism, with Discussion of End-Results. G. Crile.—p. 267.
Certain Fractures About Shoulder. R. Jones.—p. 282.
Obstetric Recollections, Covering Half a Century. E. H. Tweedy.—p. 292.
Advances in Obstetrics and Gynecology in Past Fifty Years. J. M. M. Kerr.—p. 299.
Adenomyosis Uteri. O. Frankl.—p. 303.
Evolution of Treatment of Cancer of Cervix of Uterus by Radical Hysterectomy. J.-L. Faure.—p. 308.
A Rare Old Irish Medical Book. E. Essen-Möller.—p. 312.
Sir William Petty. T. P. C. Kirkpatrick.—p. 315.

Journal of Pathology and Bacteriology, Edinburgh

35: 477-655 (July) 1932

Process of Formol Detoxication: Experiments with Purified Staphylococcal Toxin. F. M. Burnet and Mavis Freeman.—p. 477.
Influence of Avidity on Standardization of Antitoxins. A. T. Glenny, Mollie Barr, Helen E. Ross and Muriel F. Stevens.—p. 495.
Titration of Antipneumococcus Serum. W. Smith.—p. 509.
*Causes of Cell Death in Irradiated Human Tissue. Beatrice Davidine Pullinger.—p. 527.
Observations on Solitary Plasmocytoma. M. J. Stewart and A. L. Taylor.—p. 541.
*Bactericidal Power of Normal Serum. J. Gordon and H. S. Carter.—p. 549.
*Primary Carcinoma of Liver: Study of One Hundred and Thirty-Four Cases. J. C. Tull.—p. 557.
Chorionepithelioma of Testis. Joan M. Ross.—p. 563.
Congenital Abnormality of Hair Follicles in Dogs Resembling Trichostasis Spinulosa. T. Hare.—p. 569.
Routine Preparation of Diphtheria Toxin of High Value. C. G. Pope and Margaret Llewellyn Smith.—p. 573.
Experimental Nephritis Produced by Styryl Quinoline Compound No. 90. H. L. Sheehan.—p. 589.
Occurrence and Distribution of Intranuclear "Inclusion Bodies" in Gliomas. Dorothy S. Russell.—p. 625.

Causes of Cell Death in Irradiated Human Tissue.—Pullinger states that a review of observations on irradiated biologic structures reveals that, although direct injury to individual cells can be demonstrated, it is found that when vascular tissues are exposed to radium and roentgen rays an essential part in the cellular reaction is played by blood vessels. Her own observations on irradiated human tissue show that a regular series of events occurs in blood vessels. She stresses the vascular reaction because it seems to her that as a cause of cell death it predominates over any possible direct injury under conditions of therapeutic irradiation. Moreover, it explains a number of clinical observations.

Bactericidal Power of Normal Serum.—According to Gordon and Carter, adsorption of normal guinea-pig and rabbit serums with heated and washed bacterial suspensions at 0 C. removes from the serums the bactericidal power against a number of organisms. This adsorption is in no sense specific, the bactericidal power of the serum for the least sensitive organisms being removed first and then that for the more sensitive organisms being removed later. It is suggested that the bactericidal power of normal serum against various organisms is not due to the presence of specific natural antibodies. The author's results support the opinion of Muir that variations in the bactericidal power of normal serum against different organisms depend on the sensitiveness of these organisms to nonspecific factors in serum (complement plus a heat stable factor).

Primary Carcinoma of Liver.—Tull calls attention to the fact that primary carcinoma of the liver is comparatively frequent among natives of certain provinces in southern China. It is a disease of middle age and usually reaches an advanced stage before symptoms appear. Flukes are not commonly present. Cirrhosis of the liver is present in the great majority of cases, especially those of liver cell type. The liver cell type is nearly three times as common as the bile duct type. The right lobe of the liver is much more frequently involved than the left, but the gallbladder is seldom affected. The liver may be riddled with new growth and still function normally as judged by various function tests. Metastases are less frequent than in primary carcinomas of other organs. Splenomegaly is often present.

Lancet, London

2: 1-56 (July 2) 1932

*Antenatal Care and Maternal Mortality. F. J. Browne.—p. 1.
Reactions of Eye to General Disease. F. A. Williamson-Noble.—p. 4.
Treatment of Lobar Pneumonia by Felton's Serum. J. Cowan, A. W. Harrington, R. Cruickshank, D. P. Cuthbertson and J. Fleming.—p. 8.
*Relationship of Climatic Bubo and Lymphogranuloma Inguinale. G. M. Findlay.—p. 11.
Carotene and Vitamin A. B. Woolf and T. Moore.—p. 13.

Antenatal Care and Maternal Mortality.—The failure of antenatal care to prevent mortality is explained by Browne as follows: 1. It cannot as yet prevent such causes of death as sepsis or postpartum hemorrhage after normal easy labor. 2. If it has diminished the incidence of complicated labor it has led to an increase of unnecessary interference by the induction of premature labor and cesarean section with a fairly high death rate. It has thus to some extent simply transferred the causes of mortality from one column to another. 3. Little is being done in the average antenatal clinic to prevent eclampsia. The need for more careful work in this respect is stressed. 4. The high death rate in hospitals from the minor complications of labor seems to indicate the importance of the principle of the resident senior medical officer. Too often these "minor" operations are left to junior house surgeons with little or no experience, who are allowed to carry on without any supervision. 5. Much of what passes under the guise of antenatal care is too irregular, too infrequent, too ill organized and perfunctory to deserve the name.

Relationship of Climatic Bubo and Lymphogranuloma Inguinale.—Findlay describes experiments in which he demonstrated that climatic bubo is due to a filtrable virus. The virus when inoculated intracerebrally produces in monkeys and mice a meningo-encephalomyelitis; inoculated into the groin of guinea-pigs, it may give rise to a bubo. The serum of patients with climatic bubo possesses protective properties; the serum of patients with lymphogranuloma also possesses protective properties for the virus of climatic bubo. The author presents evidence that climatic bubo and lymphogranuloma inguinale are one and the same condition.

Medical Journal of Australia, Sydney

1: 815-846 (June 11) 1932

Intravenous Administration of Blood Saline Solution and Glucose. I. J. Wood and C. W. Ross.—p. 815.
*Experimental Renal Disease Produced by Roentgen Rays: Late Results of Irradiation. M. S. S. Earlam and A. Bolliger.—p. 826.
Note on Disappearance of Mitotic Phases from Irradiated Tissue Cultures. W. H. Love.—p. 829.

Experimental Renal Disease Produced by Roentgen Rays: Late Results of Irradiation.—Earlam and Bolliger describe experiments in which they demonstrated that the fibrous tissue replacing the cortical tubular necrosis produced by exposure of the kidney to a single heavy dose of roentgen rays eventually undergoes hyaline change, while the glomeruli, apparently undamaged by the actual irradiation, undergo atrophy and hyaline change. After recovery has occurred from the acute renal lesion that follows exposure of one kidney to a sublethal dose of roentgen rays, the opposite kidney having been removed, there ensues an indefinitely prolonged period of histologic and functional stabilization in which, apart from hyalinization of Bowman's capsule, no late progressive or degenerative lesion of the surviving renal parenchyma develops.

"Gann," Japanese J. Cancer Research, Tokyo

26: 1-174 (March) 1932

Carcinoma Sarcomatodes Mammae of Dog: Its Transplantation. K. Imamaki.—p. 1.
Transplantable Round-Cell Sarcoma in Dogs. K. Imamaki.—p. 29.

26: 175-252 (June) 1932

Ultraviolet Absorption Spectra of Tumor Extracts, Especially of Rous Chicken Sarcoma. M. Sumi and W. Nakahara.—p. 175.
Cataphoresis Experiments on Filtrable Agent of Rous Chicken Sarcoma. H. Nakajima and W. Nakahara.—p. 181.
Tissue Culture of Dog's Endothelium, with Especial Consideration of Nature of Tumor Cells. K. Imamaki.—p. 190.

Lyon Médical

149: 669-692 (May 29) 1932

Oily Suspensions in Gold Therapy of Pulmonary Tuberculosis. H. Mollard.—p. 669.
Case of Porencephalia. Bonnamour and Vansteenberghe-Joly.—p. 681.
*New Case of Tuberculous Hemoptysis Cured by Blood Transfusion. Pic and A. Chapuy.—p. 686.

Tuberculous Hemoptysis Arrested by Blood Transfusion.—Pic and Chapuy report the cure of a resistant case of tuberculous hemoptysis by blood transfusion. The first report of this mode of treatment was made in February, 1932, by Bonnamour and Vansteenberghe. They reported the cure by blood transfusion of a case of hemoptysis, which occurred after therapeutic pneumothorax and was not arrested by compression. In the authors' case the hemoptysis was the first actual clinical manifestation of tuberculosis. The patient, a man aged 26, entered the hospital about two weeks after the sudden onset of a recurrent, severe form of hemoptysis. Failure of the classic treatment to arrest the daily hemoptysis of 80 cc. resulted in the decision to perform a blood transfusion. The transfusion, consisting of only 100 cc. of blood, resulted in immediate arrest of the hemoptysis and a great improvement in the general condition. There has been no recurrence of hemoptysis since the day of transfusion.

Paris Médical

2: 77-92 (July 23) 1932

Chronic Malaria. A.-F.-X. Henry.—p. 77.
*So-Called Agastric Anemias: Rôle of Digestive Tract in Pernicious Anemia. C. Dreyfus.—p. 84.
Meniscal Syndrome. A. Schwartz.—p. 91.

So-Called Agastric Anemias.—Dreyfus reviews the literature dealing with the rôle of the digestive tract in pernicious anemia and presents case reports of agastric anemia which he thinks confirm the theory that the digestive tract and particularly the stomach plays an important part in the etiology of pernicious anemia. The observations fall into three groups. The first group concerns patients who, following extensive resection of the stomach, developed anemia of the hyperchromic type like that seen in pernicious anemia. The second group concerns patients who, following simple gastro-enterostomy without resection, developed all the nonhematologic signs of pernicious anemia without the anemia. These observations support Hurst's theory that achlorhydria is the essential predisposing cause of subacute combined degeneration of the spinal cord and pernicious anemia, regardless of the cause of the achlorhydria. The third group is represented by the case report of a patient in whom the function of a large part of the gastric mucosa was destroyed by drinking of a caustic liquid and who had undergone gastro-enterostomy. In this patient the anemia was intermediary with hematologic characteristics of both hyperchromic and hypochromic anemia. In addition, she presented a series of symptoms always observed in pernicious anemia. The author thinks these observations may be compared with the brilliant therapeutic results obtained by administration of extract of the gastric mucosa.

Presse Médicale, Paris

40: 1133-1156 (July 20) 1932

Surgery of Parathyroids: Future and Significance. R. Leriche.—p. 1133.
Gangrenous Phlegmons of Face of Dental Origin. D. Petit-Dutaillis, R. Leibovici and A. Lattès.—p. 1136.
*Oleothorax. A. Bernou.—p. 1139.

Oleothorax.—Bernou first reviews the indications for oleothorax. One of the most important of these is progressive pleural symphysis. When this condition develops early, the results of the pneumothorax are frequently compromised and it is necessary to have recourse to oleothorax. This intervention should aim at complete blockade by sterilized olive oil or liquid petrolatum of the residual cavity of the pneumothorax, which is on the way to becoming obliterated. Another indication for oleothorax is insufficient pulmonary collapse following pneumothorax when there are no adhesions but progressive elevation of gaseous pressure is without therapeutic effect. Oleothorax is rarely indicated in serofibrinous pleural effusions. Only the serofibrinous pleurisies of artificial pneumothorax with persistent slight fever and incessant reproduction of fluid can be cured in this way. Oleothorax is indicated only in those forms of purulent tuberculous pleurisy which are severe from the beginning or are secondarily aggravated and which do not respond to other treatment. To avoid failures, oleothorax should be reserved for the pyothorax that follows a momentary pleurocortical evolution or the opening of a small focus in cases in which the collapsed lung does not contain any large lesions with a tendency to spread. The author emphasizes the importance of measuring the oil pressure and describes an oleomanometer designed by himself. For prevention of severe febrile reactions it is imperative to test the susceptibility of the pleura by injection of a small quantity of oil. If there is no reaction, the blockade should be completed as quickly as possible in a case of pneumothorax. This is facilitated by the use of two syringes, one for evacuation of the air, the other for injection of oil. After completion of the oleothorax, the loss of oil by resorption must be equalized by renewed injections. In cases of pyothorax, from 200 to 500 cc. of oil should be injected after complete thoracentesis. To avoid pleuropulmonary perforation, compressive oleothorax should not be induced in pleural cavities divided by adhesions or in cases in which the collapsed lung contains cavities with spreading disease processes. Most frequently, perforations of the pleura result from the evolution of lesions in the collapsed lung. This can be guarded against by watching the clinical signs, expectoration of tubercle bacilli, râles, fever, loss of weight and roentgenologic observation of the variation in volume of the caverns under oleothorax.

Minerva Medica, Turin

23: 33-64 (July 14) 1932

Research in Icteric Form of Hemolytic Jaundice. F. Micheli and G. Dominici.—p. 33.
*Splenomegalic Pernicious Anemia of Pende Type. G. Santucci.—p. 43.
Treatment of Tuberculous Pleurisy. G. Pirani.—p. 51.

Splenomegalic Pernicious Anemia of Pende Type.—Santucci states that Pende's type of splenomegalic pernicious anemia presents the fundamental hematic alterations of the disease with or without leukopenia and megaloblasts, with a definite lack of platelets, and with occasional myelocytes. The symptomatology consists of gastro-intestinal disturbance, fever, diarrhea, and rapid increase of the anemic state. During remissions the blood picture improves with the appearance in the circulation of normoblasts and red corpuscles with granulofilamentous substances, so that the hematic report is similar to that of the blood crisis of pernicious anemia. Microscopic examination of the spleen reveals numerous immature cells characteristic of the premedullary or prehepatic phase of hematopoiesis; namely, along the scale from promegaloblasts up to orthochromatic megalocytes. When megaloblasts are lacking in the circulation, hyperchromic megalocytosis is sufficient to substantiate the pernicious type of disease. The author states that this type of anemia and aleukemic myelosis are frequently confused. In both diseases there is general malaise, loss of appetite, feeling of heaviness in the left hypochondrium and progressive pallor of the skin and mucous membranes: 1. In myelosis the symptomatology is continuous and progressive; in anemia it is paroxysmal, with periods of rest and regression. 2. Fever occurs in both forms but is more pronounced in anemia. 3. There is no hemolytic increase in myelosis, while there is an increase in anemia. 4. In anemia the splenic tumor attains a more notable size than in myelosis. 5. In both diseases the spleen shows immature leukocytes and erythrocytes, but in myelosis proliferation of the white cells predominates. 6. In anemia the examination of the bone marrow offers proof of megaloblastic transformation; in myelosis it shows a prevalence of leukoblastic proliferation or signs of osteosclerosis.

Policlinico, Rome

39: 317-372 (July 1) 1932. Medical Section

Relation Between Periodic and Alternating Phenomena of Heart. V. Chini.—p. 317.
Case of Absent Corpus Callosum; Heterotopy, Degeneration of Abnormal Bundles. A. Giannelli.—p. 328.
*Rare Form of Pancreatic Hypofunction in Calculosis of Gallbladder. G. Gherardini.—p. 347.
Case of Acute Glanders. E. Mondolfo and A. Moretti.—p. 357.
Hematopoietic Action of Some Amino-Acids. N. Ciampi.—p. 365.

Pancreatic Hypofunction in Cholelithiasis.—Gherardini states that reflex anomalies often accompany diseases of the gallbladder, especially calculosis. He reports a case of pan-

creatic insufficiency associated with biliary lithiasis in which cholecystectomy was performed; digital exploration of the pancreas through the laparotomy incision disclosed a moderate hardening there. The extirpated gallbladder showed no signs of inflammation, nor adhesions. Microscopic examination also revealed the complete lack of histopathologic lesions of the inflammatory type. The author maintains that the postoperative behavior of the pancreatic secretion could not have shown oscillations that justify the concept of an automatic regression and functional restitution in the short time between the operation and second period of functional examination, since the patient bore no evidence of cholecystitis and since a hardening of the pancreas does not prove the existence of inflammatory sclerotic lesions. After operation, a notable improvement in the function of the pancreas was observed. The secretory anomalies are explained by a nervous path through which inhibitory stimuli may influence the secretory activity of individual organs and the parenchyma by true or vascular cellular mechanisms. In this case the stimuli came from the calculous gallbladder, the pathologic reflexogenic center, and led to pancreatic achylia.

Archiv für Gynäkologie, Berlin

149: 529-780 (June 24) 1932

*Genesis, Clinical Aspects and Therapy of Endometriosis. L. Seitz.—p. 529.
Quantitative Elimination of Follicular Hormone and of Hormone of Anterior Lobe of Hypophysis at End of Gestation. H. Runge, H. Hartmann and K. Sievers.—p. 608.
Actions of Estrus Inducing Hormones on Lipases. O. Mühlbock and C. Kaufmann.—p. 623.
*Adhesiveness of Leukocytes as Functional Test: Significance for Gynecologic Problems. H. Eufinger.—p. 630.
Experiences with Simple Seroreaction (Manoiloff) for Diagnosis of Pregnancy (Second Modification). E. Manoiloff.—p. 645.
Origin of Postoperative and Puerperal Thrombo-Embolism. Gaessler.—p. 650.
Influence of Physical Exertion on Heart and Circulation. H. Krukenberg.—p. 663.
Action of Extract from Suprarenal Cortex on Genitalia of Female Rabbits. E. Engelhart.—p. 688.
Melanotic Pigment in Vaginal Epithelium. W. Schiller.—p. 694.
Determination of Virulence of Bacteria Previous to Operative Treatment of Uterine Carcinoma. H. Brunner.—p. 702.
Statistics on Lying-In Hospitals and on Deliveries in Such Institutions. Hanauer.—p. 737.
Georg Prochaska's (1749-1820) Contributions to Gynecology. J. Stur.—p. 757

Genesis and Therapy of Endometriosis.—In discussing the genesis of heterotopias of the uterine mucous membrane, Seitz calls attention to the fact that they frequently concur with uterine myomas and that both these conditions are influenced by the ovarian hormones. He thinks that the diagnosis of endometriosis is justified (1) when the histologic examination reveals the typical structure of the endometrium, (2) when the cells show cyclic changes, or if in the case of pregnancy, they show a decidual reaction, and (3) when typical menstrual hemorrhages are noticeable, for instance from the endometrioses of the umbilicus or from the heterotopias that have perforated into the intestine or the bladder. Should the histologic examination fail to reveal the typical aspects of endometriosis, the diagnosis endometriosis is nevertheless justified when the blood indicates that cyclic hemorrhages have taken place, as in the case of chocolate cyst of the ovary or when dysmenorrheal pains or other disorders at the time of menstruation indicate a reaction of the tissue to the stimulation of the ovarian hormones. The author also points out that hematosalpinx and chocolate cysts originating in endometrioid foci may be the cause of an erroneous diagnosis of tubal pregnancy. He further discusses the character of endometrioses, namely, whether they are always benign or whether they may undergo malignant degeneration, and after giving a tabular report on the localization of the sixty-five cases observed by him he gives a clinical classification. He differentiates three types: (1) endometriosis interna, (2) retrocervical endometriosis with infiltration of the posterior uterine ligaments, and (3) endometriosis of the ovaries (chocolate cysts), of the tubes and of the pelviperitoneum. Following a discussion of the symptomatology, particularly of the various menstrual disturbances, the treatments are evaluated; namely, roentgen therapy and surgical methods. Because endometriosis can be cured without exclusion of the ovarian function the author concludes that, although the ovarian function is necessary for the development of endometriosis, it is not its cause. For young women he considers surgical treatment better than castration by roentgen therapy. He warns that patients with endometriosis require observation for about five years following the treatment, just as do patients with carcinoma.

Adhesiveness of Leukocytes as Functional Test.—Eufinger shows that the determination of the adhesiveness of the leukocytes represents a simple functional test of the living cells, which permits, especially if combined with the study of the morphologic blood picture and of the sedimentation speed, the estimation of the defense powers of the organism. The adhesiveness of the leukocytes is a complex general reaction, but it is not dependent on either the morphologic blood picture or the sedimentation speed. The adhesiveness of the leukocytes is influenced by the menstrual cycle. Tests on women with normal menstruation revealed that shortly before the beginning of the flow the degree of adhesiveness of the leukocytes decreases considerably. With the onset of menstruation, however, the adhesiveness increases far above the normal values, sometimes to more than double, and this condition persists for the first two or three days, but on the last day of the flow and shortly after its termination there is again a considerable decrease. In the intermenstrual period the adhesiveness is the same as in healthy men. During gestation the adhesiveness of the leukocytes increases with the advancement of the pregnancy. After delivery it decreases and during the puerperium it gradually approaches normal values. During pregnancy the increasing adhesiveness goes parallel with the progressive acceleration of the coagulation time. The author thinks that the concurrence of these two factors may perhaps have an etiologic significance in the high incidence of thrombosis in the early puerperium. The adhesiveness of the leukocytes of the blood of the umbilical vein is considerably reduced. In carcinoma and in inflammatory disorders, the examination of the functional capacity of the leukocytic apparatus is a valuable clinical aid in the therapeutic and prognostic evaluation.

Beiträge zur klinischen Chirurgie, Berlin

155: 481-640 (June 22) 1932

Cystic Mamma: Incidence and Significance. M. Borchardt and R. Jaffé.—p. 481.
*Diagnostic Mistakes in Primary Pulmonary Carcinoma. K. Steinthal.—p. 515.
*Postoperative Gastrocolic Fistula. P. Mac Lean.—p. 525.
Action of Copper Impregnation and of Iodine Impregnation When Infected Catgut Is Introduced into Organism. G. von Linden.—p. 535.
Bilateral Symmetrical Cancer. T. Teichmann.—p. 549.
Structure of Joint Mice. M. Schubert.—p. 553.
Life Expectancy of Infants with Congenital Atresia of Rectum. Meta Sangals.—p. 571.
Resorption Capacity of Bladder and Urethra and Its Significance for Anesthesia of Their Mucous Membrane. S. Frey.—p. 577.
Approach to Anterior Portion of Elbow Joint by Means of Läwen's Median Incision. K. Gerlach.—p. 589.
Tension Pneumabdomen or Gas Peritonitis? W. Bergemann.—p. 597.
Healing Processes in Reduced Congenital Dislocation of Hip Joint. J. Gangler.—p. 604.
Prognosis of Carcinoma of Tongue with Especial Consideration of Degree of Malignancy. W. Rieder.—p. 611.
Mistakes, Dangers and Unforeseen Complications in Surgical Treatment of Patients with Mental Disturbances, Neurosis, Epilepsy and Narcomania. A. Juželevskij.—p. 623.

Diagnostic Mistakes in Primary Pulmonary Carcinoma.—Steinthal points out that pulmonary carcinoma is frequently mistaken for a pulmonary abscess and that this is partly due to the peculiar location and development of the neoplasm. A second factor not yet sufficiently known is that pulmonary carcinomas have a tendency to metastasize to the skeletal system, particularly the thoracic and lumbar vertebrae, and that these bone metastases may become manifest earlier than the primary pulmonary focus. The author then discusses the clinical history of a man, aged 40, with primary pulmonary carcinoma, in whom, nine months previous to the development of the pulmonary manifestations, metastases developed in the lower thoracic and the upper lumbar vertebrae. The latter caused at first severe neuralgic pains. Because of wrenching and contusion of the spinal column which the patient suffered in an automobile accident, a traumatic tuberculosis of the spinal column was assumed and the pulmonary symptoms that later became manifest were thought to be the result of a broncho-

pneumonic pulmonary abscess that had no connection with the trauma. The problem was not definitely solved until the postmortem examination was made, because all those who examined the patient had not taken into consideration that prolonged fetid pulmonary abscesses may mask carcinoma, and also that pulmonary carcinoma may metastasize to the vertebral column and thus cause root symptoms before signs of pulmonary disease appear. Roentgen examination of the vertebral column was not done until about a year after the accident and nine months after the first appearance of the vertebral symptoms. Moreover, the changes that are characteristic for tumor (lessened density in the center of the vertebra with preservation of the cortex and of the intervertebral fibrocartilages) in contradistinction to the typical tuberculous changes (destruction of the intervertebral fibrocartilages) were not given sufficient attention. The author thinks that cases of this type indicate that the diagnosis of traumatic tuberculosis has to be made with great caution.

Postoperative Gastrocolic Fistula.—Mac Lean gives the clinical histories of six cases of postoperative gastrocolic fistula and then discusses the symptomatology. The anamnesis usually reveals gastric disturbances of several years' duration, a previous gastric operation and after more or less severe, renewed ulcer symptoms, sudden diarrheas, foul eructation and occasionally stercoraceous vomiting. The patients lose weight rapidly, but distention of the abdomen is absent and there is no admixture of blood in the feces. Thus tumor of either the stomach or the colon can be excluded. Helpful for the diagnosis is the observation made by the patients that undigested particles of food are eliminated in the stools. The author considers roentgen examination helpful primarily for the differentiation between gastrocolic and duodenocolic fistulas. In gastrocolic fistula there is an irregular demarcation of the gastric shadow as indication of an always existing gastritis and the fistula is nearly always on the lienal portion of the transverse colon. In duodenocolic fistula, however, roentgen examination reveals a healthy stomach and normal evacuation into the duodenum, but then there is a rapid advancement of the shadow far to the right and downward. In discussing the operative treatment of gastrocolic fistula, the author discusses the radical procedure in which the fistulous portions of the stomach and of the intestine are resected, and the conservative operation in which the fistulous portions are only detached from each other and the resulting openings are sutured. He stresses the superiority of the conservative method, which has the far lower mortality rate. He thinks that the difficulty and the long duration of the radical operation militate for more conservative methods, the more so since resection does not preclude relapse. He admits, however, that a radical procedure is necessary when carcinoma is present.

Deutsche Zeitschrift für Chirurgie, Berlin

236: 485-572 (July 9) 1932

Roentgenspectrographic Investigation on Bones: Crystalline Structure of Inorganic and of Organic Parts of Bones. C. Henschen, R. Straumann and R. Bucher.—p. 485.
*Nature of Protective Action of Gastric Mucus. R. Bucher.—p. 515.
Multiple Diverticula of Jejunum. A. Christ.—p. 560.
Peculiar, Severe Eye Injury with Favorable Outcome. A. Christ.—p. 571.

Nature of Protective Action of Gastric Mucus.—Bucher points out that it has long been known that the gastric mucus protects the gastric wall against thermic, chemical and mechanical injuries; however, whether the mucus exerts a protective action against the stomach's own juice, and whether a deficiency in this protective action may perhaps be a causal factor in gastric ulcer, are problems still to be solved. To throw more light on them the author made extensive studies on the gastric mucus. After reporting his observations on the topography of the mucus he describes its colloidal chemistry, particularly its swelling process in an acid, neutral or alkaline medium. The swelling in the acid medium is essentially a coagulation of the gel micelles, and it increases the elasticity, the internal coherence and the viscosity. The author contradicts the theory that the gastric mucus normally has an alkaline reaction but asserts that, if a gastric juice with a good digestive action is present, the mucus has an acid reaction. It is neutral or slightly alkaline after extensive gastric irrigation, or when substances that have a great binding power for acids (blood, pus, disintegrating tumor) are present in the stomach. Within the first four hours after death, the acidity of the gastric mucus changes into a neutral and later into an alkaline reaction. In the state of acid coagulation, the gastric mucus adsorbs much less pepsin than neutral or alkaline mucus. This is due to the fact that the p_H of the mucus (between 3 and 3.5) is also the p_H of the iso-electric point of pepsin. Thus the protective action of the gastric mucus is due to the fact that in the state of acid coagulation it presents the optimum of mechanical quality as well as of chemical inactivity or neutrality. The author further shows that, synchronously with the secretion of the gastric juice, the mucus passes through three phases. During the last phase, existing during the period of active digestion, the mucus is in the optimal state of acid coagulation. In calling attention to the increased dispersion of the gastric mucus induced by alkalinity, and to the resulting decrease in the resistance against the gastric juice, the author points to the dangers of alkali therapy, especially of the Sippy treatment.

Klinische Wochenschrift, Berlin

11: 1209-1248 (July 16) 1932. Partial Index

Influence of Economic Crisis on Standard of Living and on Nutrition of German People. Von Tyszka.—p. 1209.
*Observations on Nerves of Human Stomach and Their Changes in Chronic Ulcer. P. Stöhr, Jr.—p. 1214.
Influence of Anterior Lobe of Hypophysis on Action of Thyroid. W. Grab.—p. 1215.
Action of Injectable Liver Extract. H. E. Büttner.—p. 1218.
Clinical Aspects of Porphyria and Simple Method for Demonstration of Porphyrin in Urine. G. Holland and A. Schürmeyer.—p. 1221.
Qualitative Difference of Two Types of Blood Group A. H. Lehmann-Facius.—p. 1222.
Microscopic Observation of Living Thyroid in Mammals. W. Hartoch.—p. 1224.
Dependence of Number of Leukocytes in Blood on Digestion and on Muscular Activity. D. Raisky.—p. 1225.
Allergic Diseases: Constitution and Heredity. F. E. Haag.—p. 1228.
Meinicke Clarification Reaction as Immunity Reaction in Gonorrhea. C. Bruck and K. Behrmann.—p. 1230.

Nerves of Stomach and Their Changes in Ulcer.—Stöhr first describes the nervous elements in the normal stomach, the nerve fibers and the ganglion cells, and their distribution in the muscular apparatus and in the capillary system. Further he relates his observations on eighteen resected stomachs of patients with gastric ulcer. He subjected Auerbach's and Meissner's plexus to careful microscopic study not only in the region of the ulcer but also in the entire resected portion. In every case of chronic ulcer he noted ganglion cells with pathologic changes; namely, processes of transformation, decreased density of the nuclear plasma, increase and marginal arrangement of the chromatin, pyknosis and disintegration of chromatin, indentations in the nuclear membrane, deformation of the nucleus, and manifestations of swelling and of shrinking of the entire nucleus. Finally, complete disintegration of the eccentrically located nucleus may take place. The fibrillar structure of the cell protoplasm appears frequently condensed, and peculiarly shaped defects that are filled with light plasma, and vacuoles and window-like formations become noticeable, and the surface of the cell body sometimes appears as if gnawed on. In progressive processes of disintegration, the center of a cell often forms a single vacuole, while the pyknotic nucleus is pressed against the periphery, or shreds of neuroplasm with small nuclei are found. On the large processes of the ganglion cells the author observed in only one instance an abnormal spindle-like protrusion, and in another case fine fibrillar, toothlike formations that resembled small flames. In the ganglion cells that are found in the ulcer a small cellular infiltration is occasionally noticeable, but it may be absent in considerably degenerated ganglion cells. On the base of the ulcer whole ganglion cells may disappear, and their former location is indicated by a considerable accumulation of round cells. Although the region of the ulcer has the largest number of degenerated ganglion cells, they are also found in parts far removed from the ulcer. In the nerve fibers, degenerative changes are rare. Once the author observed in an Auerbach ganglion, located near the margin of the ulcer, protrusions on an axis cylinder. Otherwise, even in the ulcerated and necrotic zones, the axis cylinders are found normal. The question as to whether the ulcer causes the changes on

the nervous apparatus, or whether the nervous changes are a pathogenic factor in the development of the ulcer, the author feels unable to answer on the basis of only histologic studies.

Monatsschrift für Kinderheilkunde, Berlin

54: 1-84 (June 18) 1932

Surgical Complications in Measles. Gertrud Trepel.—p. 1.
Frequency of Syphilis in Childhood. E. Rominger and L. Szegö.—p. 20.
Criticism of Term "Chronic Miliary Tuberculosis of Lung" in Children. W. Schwenk.—p. 32.
*Intralumbar Application of Therapeutic Serums. H. Fasold and H. Grossmann.—p. 48.
*Alimentary Allergy of Children with Eczema. A. Strobl and A. Wasitzky. —p. 53.
Hypersecretion of Gastric Juice in Young Nursling. G. Meyer zu Hörste.—p. 65.
Clinical Aspects of Severe Burns During Childhood. B. Ostrowski. —p. 73.
Cardiac Beriberi During Nursling Age. J. Albert.—p. 80.

Intralumbar Application of Therapeutic Serums.—Fasold and Grossmann show in tests on rabbits that intravenously administered diphtheria antitoxin is brought to the nervous elements of the central nervous system by way of the blood stream. In this manner it is possible to effect a complete, passive immunization against a subsequent cerebral poisoning with diphtheria toxin. The authors do not consider the intralumbar administration of therapeutic serums necessary in diphtheria, scarlet fever or tetanus. The intravenous injection of serums is just as effective.

Alimentary Allergy of Children with Eczema.—Strobl and Wasitzky state that among twenty-one manifestly exudative children they detected, with the complement fixation method, in five instances antibodies against egg albumin, four of which were in the eczema zone, and in five cases antibodies against cow's milk, three of which were in the zone of eczema. The cutaneous reaction toward egg albumin was more often positive than the seroreaction. In the serum of seven young nurslings, who later became exudative, the authors detected antibodies once toward egg albumin in the eczematous zone, and once against cow's milk. After-examinations were made on thirty children up to 10 years of age, who had been cured of eczema. In three cases antibodies for egg albumin were found, twice in the zone of eczema, and in six children antibodies to cow's milk were detected. In twenty-three children examined, the cutaneous reaction to egg albumin was positive sixteen times. In thirteen cases there existed hypersensitivity to foods; in nine of these it was toward egg, but in only three instances did the hypersusceptibility become manifest in relapse of eczema. In the serum of three adults whose anamnesis revealed exudative manifestations, egg albumin antibodies were not demonstrable, in spite of the fact that the cutaneous reaction to egg albumin was positive.

Wiener klinische Wochenschrift, Vienna

45: 865-896 (July 8) 1932

Permanent Impairment of Circulatory Apparatus Following Severe Diphtheria. A. F. Hecht.—p. 865.
Significance of Local Anesthesia for Course of Local Laparotomy. H. Finsterer.—p. 868.
*Experimental Studies on Electrolyte Threshold of Serum as Diagnostic Aid in Gonorrheal Disorders of Adnexa. G. Sicher and A. Wiedmann.—p. 876.
Diagnostic Significance of Posterior Celiotomy in Extra-Uterine Gravidity. M. Scharman.—p. 877.
Epidemic of Serous Meningitis. L. Berkesy.—p. 879.
Hypophysis and Genitalia. B. Aschner.—p. 882.
Initial Symptoms of Diabetes During Childhood. R. Wagner.—p. 884.
Operative Treatment of Roentgen Injuries of Skin. L. Moszkowicz. —p. 885.

Electrolyte Threshold of Serum in Gonorrheal Salpingitis.—Sicher and Wiedmann, after calling attention to the difficulty of the diagnosis of gonorrheal disease of the adnexa, describe their experiences with the electrolyte threshold test that they performed on the serums of approximately ninety patients. Tabular reports show the outcome of these tests: in acute inflammatory gonorrheal involvement of the adnexa the electrolyte threshold is increased; that is, a higher percentage of the electrolyte substance has to be added to the serum to effect coagulation. After the acute manifestations have disappeared, the electrolyte threshold subsides again to the normal level or even below it. The authors admit that the electrolyte threshold determination is not a complete substitute for the complement fixation test, but it proves helpful in those cases in which the complement fixation test does not give satisfactory results, and in combination with the bacteriologic demonstration of the gonococci it is a valuable aid in the diagnosis of gonorrhea of the adnexa.

Zeitschrift f. d. ges. Neurol. u. Psychiatrie, Berlin

140: 657-830 (July 19) 1932

*Cerebral Changes in Cardiac Disorders. G. Bodechtel.—p. 657.
*Blood Sugar Tolerance Test for Blood Chemical Differentiation of Constitutional Types. O. Hirsch.—p. 710.
Striatum and Skeletal Musculature, Striatum, Hypothalamus and Liver in Hepatolenticular Degeneration (Wilson's Disease). G. Ricker. —p. 725.
Studies on the Uncus with Consideration of Gyrus Hippocampi in General. R. Altschul.—p. 742.
Presbyophrenia and Cerebral Arteriosclerosis. M. Liebers.—p. 765.
Epilepsy and Chronic Progressive Hyperkinesia in Five Male Children in One Family. I. G. Iljon.—p. 773.
Functional Genetic Analysis of Cerebrospinal Fluid in Syphilis. V. Kafka.—p. 778.
Functional Genetic Analysis of Cerebrospinal Fluid in Cerebral Tumor. V. Kafka and B. Badt.—p. 789.
Schizophrenia with Neurologic Symptoms. G. Bychowski.—p. 798.

Cerebral Changes in Cardiac Disorders.—In histologic studies on macroscopically normal brains of cardiac patients without mental disorders, Bodechtel discovered changes in the cortex and in the medulla. The changes have "vasal" character and are due partly to organic and partly to functional circulatory disturbances. In two children with congenital cardiac defects (transposition of large vessels) there was stasis of the cerebral vessels and the cerebral medulla showed extensive changes in the form of small foci, whereas the cerebral changes in adult cardiac patients are found primarily in the gray substance of the cortex. Noteworthy is the fact that emboli originating in the endocardium could be excluded in the majority of cases. Severe lesions, if they are in certain locations, may cause neurologic symptoms, such as hemiplegia and hemianopia. In one case each of chorea minor and of chorea gravidarum the author observed cortical foci that likewise were of vasal origin. For the estimation of cortical changes in patients with mental disorders, the lesions described are important in that the majority of the mentally affected do not die as the result of the mental defect but rather from other disorders and also from heart disease. It is readily understandable that under these conditions anatomic changes in the brain may be wrongly interpreted as the underlying cause of the existing psychosis. A large portion of the cases examined by the author showed considerable cortical changes without noticeable clinical symptoms. However, he realizes that the time factor has to be considered in such cases and that minor neurologic symptoms may be overlooked on account of the serious general condition. He further points out that even if the general cerebral manifestations of cardiac patients, such as profuse sweating, severe headaches, attacks of dizziness and motor unrest, cannot be localized, the described lesions show nevertheless how even the central nervous system may be impaired by the circulatory disturbances.

Blood Sugar Tolerance Tests in Three Constitutional Types.—Hirsch performed sugar tolerance tests on sixty healthy persons of the three constitutional types as classified by Kretschmer. He found that in pyknic persons the blood sugar curve rises high, remains high for a considerable time and decreases slowly, but usually not to the fasting level. In the athletic type the curve likewise rises high but then decreases rapidly, and even below the fasting level. In persons of the leptosomic (thin) type the rise is considerably less than in the pyknic and athletic types and the falling off is more rapid and reaches farther below the zero line. In the height of the fasting level of the blood sugar curve there are no essential differences between the three constitutional types. The author thinks that if the constitutional and the endocrine aspects are considered together it would perhaps be possible to explain the different alimentary blood sugar curves. He thinks that the differences might be due to the fact that in pyknic persons the activity of the suprarenals is strong, whereas in the leptosomic type it is weak, and that in the athletic type hypophyseal influences are active. In the conclusion he stresses the necessity of taking the constitutional variations in the blood sugar curves into consideration when studying blood sugar curves of patients.

Jurnal Nevropatologii i Psikhiatrii, Moscow

No. 6, 1-127, 1931

Psychosanitary Investigation of Working Conditions in Various Professions. I. A. Berger.—p. 13.
*Biochemical Changes in Cerebral Arteriosclerosis. A. E. Kulkov, V. I. Veiland and M. E. Tarnopolskaya.—p. 20.
Dementia Paralytica with Spirochetosis Demonstrated in Tissues at Necropsy. V. K. Beletskiy.—p. 25.
Diagnosis of Brain Tumors. M. P. Nikitin.—p. 35.
Surgery in Brain Tumors. A. Polenov.—p. 45.
Hemisyndrome Resulting from Disturbance in Peripheral Sympathetic Nervous System: Case. V. V. Chernikov.—p. 47.
Acute Poisoning with Hyoscyamus and Belladonna with Psychic Manifestations in Children. K. A. Novlyanskaya.—p. 55.
Alcoholism as Etiologic Factor in Epilepsy of Children. M. A. Djagarov.—p. 62.
*Reaction of Microglia in Infections of Central Nervous System. R. A. Shakhnovich.—p. 68.
Work and Scope of Russian Neuropsychiatric Dispensaries and Neuropsychiatric Dispensary Divisions During 1929-1930. L. A. Prozorov.—p. 73.
One and One-Half Years' Work with Alcohol and Drug Addicts in Tashkent Neuropsychiatric Dispensary. A. N. Kondratchenko and Kh. Ioffe.—p. 83.
Study of Nervous System of Workers in Machine-Run Agriculture. I. Z. Finkel and A. I. Ponizovskaya.—p. 89.

Biochemical Changes in Cerebral Arteriosclerosis.—Kulkov and his co-workers included in their study fifty patients with cerebral arteriosclerosis. Six were women and forty-four were men; two were 28 years of age, eleven from 30 to 40, twenty-two from 40 to 50 and fourteen over 50. They found that an increased cholesterol content of the blood was not always present. It was difficult to determine the influence of age. They were unable to note a direct relationship between the blood pressure and the cholesterol content. The increase in blood pressure in most of the patients was not significant; only in 25 per cent was the blood pressure above 150. There was a tendency to increased calcium and potassium; the blood sugar was increased in ten patients and normal in the rest.

Reaction of Microglia in Infections of Central Nervous System.—Among Cajal's group of the "third elements" of the central nervous system, Shakhnovich includes the cells with few branching protoplasmic processes (oligodendroglia) and other cells without protoplasmic processes (adendroglia). The adendroglia lie between oligodendroglia and the Hortega cells. The Hortega cells have an oval, elongated nucleus surrounded by a small amount of protoplasm from which spring thin, spiny branching processes. The oligodendroglia are usually round but may be cubical, oval or elongated, with occasional protoplasmic processes, some of which contain small loaf-like protuberances. The drainage cells have a round or oval nucleus and small canaliculi or vacuoles, which act as a sieve for the nucleus and as a trench in the protoplasm. To determine the pathologic significance of these three types of cells the author studied the brain tissue obtained from eight necropsies: four from cases of cerebrospinal meningitis with fatality in 2, 3, 28 and 105 days, respectively; two from cases of brain abscess, one with localization in the right temporal region and the other with multiple brain abscesses; the seventh was from a case of chronic septicemia with metastases in the brain; and the eighth was an instance of typhus fever complicated by meningoencephalitis. He concludes that his observations proved that the primary reaction in these infections was manifested as a swelling of the oligodendroglia. The changes were diffuse; there was an hypertrophy of both the Hortega cells and the oligodendroglia with not only degeneration but proliferation. In chronic meningitis, the Hortega cells assumed changes similar to those present in chronic infection of the central nervous system, such as dementia paralytica. The author could not find any explanation for the presence of foci of degenerated oligodendroglia in connection with the blood vessels.

Bibliotek for Læger, Copenhagen

124: 223-265 (July) 1932

*Cor Pendulum: Gastroptosis: Bathygastri. K. Secher.—p. 223.
*Effect of Acetylcholine on Blood Pressure. A. Eldahl.—p. 237.

Cor Pendulum: Gastroptosis: Bathygastri.—Secher concludes that cor pendulum, the little heart, and gastroptosis usually occur together and in persons with weight low in proportion to their height; the low weight is maintained as they grow older. The development of these persons is characterized by a slow growth of the small thorax with low Faber's index, together with gradual growth of the small heart and of its transverse diameter, so that the entire body attains normal development at about the age of 40. The low stomach, however, continues as gastroptosis but is not to be regarded as a downward displacement of an organ previously normally situated, and for this condition the author suggests the special term "bathygastri" (state of low stomach).

Effect of Acetylcholine on Blood Pressure.—Eldahl states that his negative results may depend on changes in the blood vessels in the twelve cases reported, such that the acetylcholine cannot affect the musculature of the vessels, and not on the lack of effect of acetylcholine in general. There was no noteworthy effect on the subjective symptoms accompanying hypertension.

Finska Läkaresällskapets Handlingar, Helsingfors

74: 485-581 (June) 1932

Frequency of Marriage Among Prostitutes in Helsingfors. N. E. Wilén.—p. 485.
*Occurrence of Chondriosomes in Decidual Cells. C. von Numers.—p. 495.

Occurrence of Chondriosomes in Decidual Cells.—By staining according to Kull's method, von Numers succeeded in establishing the presence of chondriosomes in the decidual cells in all specimens examined by him. The chondriosomes appeared as red granules and rods, connected by thin threads and thus forming a network. They were found mainly in the central part of the cell near the germ. There was a close relationship between the localization of the chondriosomes and the distribution of the cytoreticulum in the cell plasma.

Hygiea, Stockholm

94: 497-528 (July 15) 1932

*Recent Advances in Field of Brain Surgery. H. Olivecrona.—p. 497.

Recent Advances in Field of Brain Surgery.—Olivecrona presents a report on 165 cases of tumor of the brain, 125 verified, 21 nonverified, 19 suspected. Ventriculographic examination was made in more than half the verified cases, in 27, or 21.5 per cent, of which the diagnosis was based almost exclusively on the results of ventriculography, and in most of the other cases. In the total 73 cases of glioma the operative mortality was 34.4 per cent, in the 51 nongliomatous cases, 17.6 per cent, the meningioma, neurinoma and adenoma groups showing a mortality of 19.1, 15.4 and 0 per cent, respectively. The mortality for the verified tumors was 27.2 per cent, as against 50 per cent in his material published in 1927. He operates on the day of the ventriculographic examination, usually within an hour after it. He refrains from ventriculography when there is a question of tumors that cause internal hydrocephalus, if a fairly certain diagnosis is possible without it, particularly in cases of tumors in the fourth ventricle. The value of ventriculography in determining the nature of the tumor, particularly of cerebral tumors, is emphasized.

Ugeskrift for Læger, Copenhagen

94: 705-726 (July 14) 1932

*Sporadic Goiter on Genotypical Basis and Relation to Other Thyroid Disorders (C'cn.). J. Bing.—p. 705.
*Micromethods for Determination of Blood Sedimentation Speed. J. Nordentoft.—p. 709.

Sporadic Goiter on Genotypical Basis and Relation to Other Thyroid Disorders.—Bing presents a family with nine certain and one doubtful case of sporadic goiter on a genotypical basis. He believes that the heredity can be explained as due to a dominant factor limited to the female sex and that there is no connection between the inheritance of goiter and the blood type. Of 561 cases of sporadic goiter familial disposition was assigned in 17.1 per cent, and a large series of cases of exophthalmic goiter and a smaller one of cases of sporadic goiter gave similar figures. A family with cases of sporadic goiter and primary exophthalmic goiter, a second with sporadic goiter and myxedema, and a third with sporadic goiter, exophthalmic goiter and myxedema are reported.

Micromethods for Determination of Blood Sedimentation Speed.—Nondentoft recommends the method of Langer and Schmidt to the practitioner as relatively exact, easily performed, and inexpensive.

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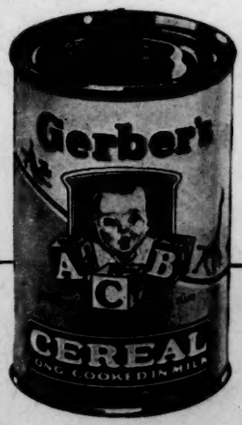

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